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University of Nebraska - Lincoln, grant.p.shulman@gmail.com

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THE DEVELOPMENT OF CASE CONCEPTUALIZATION ABILITY
IN CLINICAL PSYCHOLOGY GRADUATE STUDENTS

by

Grant P. Shulman

A DISSERTATION

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Under the Supervision of Professor Debra A. Hope

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THE DEVELOPMENT OF CASE CONCEPTUALIZATION ABILITY
IN CLINICAL PSYCHOLOGY GRADUATE STUDENTS

Grant P. Shulman, Ph.D.

University of Nebraska, 2018

Adviser: Debra A. Hope

Case conceptualization is a core clinical skill across various schools of psychotherapy. Yet, surprisingly little research has examined how student therapists develop their case formulation abilities. The present study examined 110 conceptualizations written by 27 therapists throughout their graduate training. The majority of conceptualizations were collected during a student's second or third year of clinical training. Conceptualization quality was measured with the Case Formulation Content Coding Method, and examined five primary aspects: Complexity, Precision of Language, Coherence, Multiculturalism, and Overall Quality. Additionally, the types of hypothesized mechanisms were recorded. Hierarchical linear modeling examined the contributions of time in training, previous clinical experience, GRE scores, and clinical supervisor of the report. It was expected that time in training would uniquely contribute to the improvement in case conceptualization quality after controlling for the aforementioned variables. Exploratory analyses investigated the types of hypothesized causal mechanisms and the average level of case conceptualization ability.

The main hypotheses were not supported. Time was not associated with any of the quality variables. Only supervisors predicted the quality of case conceptualization. However, exploratory analyses revealed that the hypothesized causal mechanisms

tended to become more sophisticated with time. Although quality did not robustly improve across time, results demonstrated the importance of clinical supervision on the development of case conceptualization ability. One limitation of the study was that reports were edited by clinical supervisors prior to coding in the present study, and this likely contributed to the robust supervisory effects. Future studies should examine student therapist's case conceptualizations prior to supervisory edits and monitor the effectiveness of conceptualization teaching methodologies. Overall, this study demonstrated that students write sufficient conceptualizations with the assistance of their clinical supervisor, and that the sophistication of their conceptualizations tends to improve with time.

DEDICATION

This dissertation is dedicated to my father, Elliot Ross Shulman.

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CHAPTER 1: INTRODUCTION

Case Conceptualization Techniques

Case conceptualization is one of the core features of psychotherapy including cognitive-behavioral therapy, and has been described as the “heart of evidence-based practice” (Bieling & Kuyken, 2003; p. 53). Conceptualization is the heart that synthesizes the client’s presenting problems, and directs an intervention strategy. Bergner (1998) described case conceptualization as the linchpin to psychotherapy. Aston (2009) described case conceptualization as a road map to guide treatment. Kuyken, Padesky, and Dudley (2008) described case conceptualization as a crucible in which various ingredients are combined to understand a client’s presenting problems. Although there are many definitions and analogies of case conceptualization, the majority of these papers are position papers with little empirical evidence. Further, most of the literature uses the words *case conceptualization* and *case formulation* interchangeably and synonymously. For the purpose of this paper, the *formulation* and *conceptualization* will be described as two related, but distinct, processes. *Case conceptualization* will be referred to as the explanation for a client’s presenting problems. *Case formulation* will reference the process by which a case conceptualization is developed or formed. Additionally, only cognitive-behavioral therapy (CBT) case formulation methods will be reviewed in the present document. Although other theoretical orientations also formulate conceptualizations, only CBT will be examined because it is empirically based and has various models of case conceptualization.

Although there are a variety of approaches to case conceptualization in CBT (e.g., Eells, 2010; Kuyken, Padesky, & Dudley, 2008; Persons, 2012), there is substantial similarity in their approach to case formulation. CBT case conceptualizations focus on four common elements: *presenting problems*, *precipitating factors*, *maintenance factors*, and *etiological factors*. Presenting problems refers to the initial complaints that a client brings to the therapist. Precipitating factors refers to recent stressors that occurred in the client's life that may lead to increased symptoms. Maintenance factors refer to a psychological concept, typically based on research, which explains why a client is suffering from their presenting problems. Etiological factors attempt to explain why the hypothesized mechanism developed. These four elements of CBT case conceptualization are present in every type of CBT case formulation method. However, the various methods tend to emphasize certain elements more than others, and some methods add additional elements for psychologists to consider in case formulation. The various methods of CBT case formulation are reviewed below.

One method, developed by Persons and recently updated (Persons, 2012; Persons & Talbot, 2015), includes four main elements of case conceptualization. A conceptualization should: 1) describe all of a patient's symptoms and problems; 2) hypothesize a mechanism that causes and maintains the problems; 3) describe recent precipitant events of the current problems; and 4) hypothesize the origin of the mechanism. To hypothesize the maintaining mechanism, Persons suggested to first rely on nomothetic mechanisms and theories for specific disorders, and, second, rely on general psychological principles. These mechanisms should be based on empirical

research. For example, when treating an individual with depression, a clinician may hypothesize a lack of positive reinforcement to supply a basic explanation for a major depressive episode. A clinician may also rely on general psychological concepts such as negative automatic thoughts or core beliefs as causal mechanisms for functional impairment. A final point to the Persons approach is to conceptualize at three different levels: symptom, problem, and case. Symptom-level conceptualizations focus on the individual symptoms within problems or disorders and why the individual experiences them. Problem-level conceptualizations focus on why a particular disorder or functional impairment has developed. Case-level conceptualizations attempt to explain all of the client's problems with one coherent explanation.

For example, a symptom-level conceptualization might describe how symptoms of depression are related to each other. A problem-level conceptualization may describe the maintenance of an anxiety disorder and its symptoms related to negative reinforcement of avoidant behaviors. Case-level conceptualizations tend to be more complex, and may describe how an anxiety disorder, depressive disorder, and a hospitalization are all related. Perhaps a socially anxious individual avoided interacting with people which led them to stay at home and be removed from positively reinforcing activities. The lack of positive reinforcement may have led to thoughts of hopelessness and increased suicide ideation that led to a hospitalization. According to Persons, quality conceptualizations should be able to explain behavior at all three levels, and these conceptualizations should be internally consistent.

Another CBT formulation method was developed by Kuyken, Padesky, and Dudley (2008). In their model, a case conceptualization should explain client presentations in terms of psychological theory that informs treatment. Kuyken and colleagues described case conceptualization as a crucible which represents the theory and research of cognitive-behavioral therapy and the client's experience. In the crucible, therapists combine the client's presenting problems, precipitating factors, maintaining mechanisms, vulnerability factors, and protective factors. Dudley, Kuyken, and Padesky (2011) expand on the crucible model with three principles of case conceptualization: collaborative empiricism, level of conceptualization, and client strengths. The first principle of collaborative empiricism metaphorically heats the ingredients (e.g., presenting problems) to create the conceptualization. That is, conceptualizations should be developed with the client, should synthesize the descriptive data with psychological theory, and should incorporate feedback from clients about its validity. The second principle is the level of conceptualization: disorder specific and generic. Disorder specific conceptualizations are useful when a client suffers from a single disorder, and generic conceptualizations are more useful for comorbid or complex disorders. A disorder specific conceptualization for posttraumatic stress disorder might hypothesize cognitive stuck-points from cognitive-processing therapy (Resick & Schnicke, 1993). A generic conceptualization of posttraumatic stress disorder may identify a schema that people cannot be trusted to describe social avoidance, relationship difficulties, and posttraumatic symptoms. The third principle is to include client strength and resilience factors. Examining client strengths may enhance client motivation, disrupt the

maintaining factors of a client's presenting problems, and improve treatment outcome.

Strength and resiliency factors may also reveal why the problem is present in some contexts but not others.

Eells (2010) also defined case conceptualization and provided a definition consistent with the aforementioned authors. Eells described conceptualization as a hypothesis that identifies the causal factors, precipitating events and stressors, and maintaining mechanisms for a client's presenting problems. Case conceptualization should organize information and act as a blueprint for treatment. Eells described a three step process to conceptualization. The assessor should obtain descriptive information, infer and interpret descriptive information, and then create a treatment plan that targets the hypothesized mechanisms. For example, a clinician may gather information about an academic problem for a student who self-reported that he cannot concentrate during class. During a clinical interview, the student may describe feeling fidgety, inability to concentrate on schoolwork, and relationship problems. The student may also describe experiencing intrusive thoughts about his recent ex-partner. To interpret the information, the clinician needs to gather evidence to support or refute different hypotheses, such as depressive rumination, attention-deficit disorder, or a normal coping response. Once the clinician decides on the hypothesized mechanism, the treatment plan should target this mechanism (e.g., increasing social support and activities to facilitate healthy coping responses). Eells (2015) also briefly described culturally informed case conceptualization. First, Eells suggested the therapist recognize how the client identifies culturally and the strength of this identity. Second, Eells

suggested the therapist consider how culture may affect the presenting problems. Third, Eells suggested to integrate culture into nonpathological understandings of the client (e.g., language choice, social interaction). Fourth, Eells suggested therapists examine how culture affects the therapeutic alliance.

Tarrier and Calam (2002) reviewed the functions and contents of case conceptualizations. From a cognitive-behavioral perspective, Tarrier and Calam offered three additional considerations for standard CBT case formulation approaches, which typically included identifying presenting problems and examining antecedents and consequences of behavior. They suggested clinicians should: hypothesize mechanisms as dysfunctional systems, recognize vulnerability and epidemiological factors, and examine a client's problems in a social context. The first consideration referred to broad mechanisms that maintain dysfunctional patterns of behavior. For example, an individual with an autism spectrum disorder may have a social skills deficit that caused problems at work, inability to form intimate relationships, and anxiety in social situations. The second principle, vulnerability and epidemiological factors, referred to early client experiences and characteristics that made problems more likely to occur. Perhaps the individual suffering from an autism spectrum disorder was neglected as a child and had little opportunity to develop close relationships. The third principle referred to social relationships and functional patterns of behavior in social contexts. For this autistic client, the lack of social support may represent a real concern in which people were ostracizing him in social situations because of his poor social skills.

Interestingly, only one method (Eells, 2015) described above explicitly recommended clinicians to examine culture during case formulation. In fact, there is little research that discusses multicultural case formulation. Some data suggest that including culture into conceptualizations is a different skillset compared to typical case conceptualization (e.g., Lee & Tracey, 2008). Graduate student therapists who write adept multicultural conceptualizations tend to have been exposed to cultural diversity (Weatherford & Spokane, 2003), tend to be open to new experiences (Weatherford & Spokane, 2013), and have taken numerous multicultural courses (e.g., Constantine, 2001; Lee & Tracey, 2008). Additionally, graduate student therapists tend to incorporate cultural issues into conceptualizations when explicitly mentioned by the client, but may omit culture if not mentioned by the client (Lee & Tracey, 2008). Some psychological mechanisms (e.g., minority stress; Meyer, 2003) highlight how culture may indirectly contribute to mental illness and inform case-level conceptualizations. Ultimately, incorporating culture into case conceptualization is consistent with the models of CBT case formulation, given the CBT emphasis on environment and context.

In this short review of cognitive-behavioral conceptualizations, there seems to be common elements. Case conceptualizations tend to describe the client's presenting problems, identify precipitating factors that elicited distress, hypothesize a mechanism maintaining the problems, and describe the origin of this mechanism. Although similar in content, each approach emphasized certain factors more than others. For example, Kuyken and colleagues' (2008) distinction between disorder specific and generic conceptualizations matches Persons' (2012) three-levels of case conceptualization. That

is, disorder specific is the same in both the Persons and Kuyken et al. models, and the generic level is similar to the case level described by Persons. Although Persons adds a level of individual symptoms, the Kuyken et al. model might subsume individual symptoms within the disorder specific level. Tarrier and Calam would describe generic levels of conceptualization as hypothesized mechanisms of dysfunctional systems to conceptualize how multiple problems interact within the individual. Dudley and colleagues (2011) emphasize collaborative empiricism, which is a basic component of cognitive-behavioral therapy that all of the conceptualization approaches can incorporate. Persons (2008) referred to client strengths as important to consider when implementing treatment, but not as heavily emphasized as the Dudley model. The consistent description of case conceptualization across researchers and clinicians indicates that presenting problems, precipitating stressors, mechanisms maintaining problems, and etiological factors are necessary for quality case conceptualizations.

Purpose of Conceptualization

Conceptualizations provide therapists a framework to understand their patient's problems (Flitcroft, James, Freeston, & Wood-Mitchell, 2007). Conceptualizations also allow clinicians to apply empirically supported treatments to their clients, supplement treatment decision making, identify and treat complex cases (e.g., comorbid disorders, treatment failure), and understand the process of change for client improvement. Yet, little empirical research examined the benefits of conceptualization.

Case conceptualization may assist decision making with complex cases. Many clients have comorbid disorders or severe symptoms (e.g., Kessler, Berglund, Demler,

Jin, Merikangas, & Walters, 2005). However, standardized protocols typically treat single disorders. When multiple disorders are present, the clinician must decide which problem or disorder to target first (Persons, 2012, 2013). In some cases, the clinician must decide between two different treatment manuals. Many treatment manuals may have overlapping sections and skills for a client to learn (e.g., cognitive restructuring). The clinician must then also make a judgment about which chapters to skip, the order of chapters, whether to treat the two disorders concurrently or sequentially, and a host of moment-by-moment decisions in the context of therapy (Persons, 2012, 2013; Rogers, Reinecke, & Curry, 2005; Tufekcioglu & Muran, 2015). Standardized protocols do not inform how a clinician should proceed in these areas. However, an individualized case conceptualization approach to therapy, by definition, should assist the clinician to make these difficult decisions that will affect the course of treatment. For example, when an individual suffers from panic disorder, agoraphobia, and major depressive disorder, the clinician needs to decide whether to target the panic disorder before the depression, or if the depression would interfere with panic treatment and therefore is targeted as a treatment barrier with brief problem solving strategies. Standardized protocols do not exist to treat all possible combinations of disorders; however, recent transdiagnostic protocols target clusters of disorders (e.g., Unified Protocol; Farchione et al., 2012). Regardless, the clinician must decide which disorder to target first, how to treat multiple disorders simultaneously, or even which protocol to choose for specific disorders (e.g., behavior activation for depression or interpersonal psychotherapy for depression). Case conceptualization helps psychotherapists make these types of treatment decisions.

Case conceptualizations also help clinicians implement empirically supported treatments. Treatment manuals exist for many disorders and tend to be based on rigorous research methods such as the randomized controlled trial (RCT). Standardized treatment manuals are widely used and typically have empirical data to support their efficacy. Treatment manuals should not be blindly applied to all clients with a particular problem or disorder (Persons, 2013). However, there is some disagreement in the field on this issue (e.g., Wilson, 1997). Some experts (e.g., Persons, 2012) argue that a clinician needs to adapt the treatment manual to the client in a way that is relevant to them. For example, fear hierarchies will differ between individuals with the same anxiety disorder. Although a manual will assist in the development of a hierarchy, manuals typically offer broad generalizations for clinicians to consider. Manuals do not inform the clinician exactly where on the hierarchy to begin exposure therapy, how to challenge a specific automatic thought, or how quickly to progress through the hierarchy for a particular client. These types of clinical decisions require the clinician to use their clinical judgment to apply the treatment manual to their client, and case conceptualization provides the structure to inform their clinical judgment.

Case conceptualization is a tool to assist clinicians in requesting additional sessions to best advocate for their clients (Eells, 2013). Insurance companies limit clinicians to a certain number of sessions to treat individuals with specific disorders, and clinicians must justify additional treatments or sessions to third-party payers. For example: for an individual who suffers from chronic pain, insomnia, and major depressive disorder, there are many standardized treatments for each of the problem

areas. An insurance company may initially approve 12 sessions for the client, a typical amount of time for a major depressive disorder. After 12 weeks of minimal symptom improvement, the clinician must justify additional treatment to the insurance company to continue receiving payment. Perhaps the minimal progress was not related to an ineffective therapist or low motivation to change, but to loss of social support due to the recent death of a spouse. The conceptualization could explain how the death of a spouse would limit symptom improvement, and potentially allow for additional sessions to be procured from the insurance company.

Case conceptualization also helps a clinician decide what to do when a previous manualized treatment has failed for a client. Although there is great effectiveness for cognitive-behavioral therapies, there are still a large number of treatment failures (Hofmann, Asnaani, Vonk, Sawyer, & Fang, 2012). Case conceptualization could be used to help clinicians reduce treatment failure by informing the therapist when to perform the common factors of psychotherapy (e.g., improving therapeutic alliance; Tufekcioglu & Muran, 2015), and when to target maintaining mechanisms of a client's problems. To reduce treatment failure, clinicians should gather more data, not make quick decisions based on new information, and focus primarily on the active ingredients of treatment (Schulte & Eifert, 2002). Case conceptualization can help organize new information in a way to help clinicians prevent future treatment failures.

Case conceptualization also presents an opportunity for researchers to examine the patient, therapist, and the therapeutic alliance to outcome research instead of just specific techniques in RCTs (Eells, 2013). Therapeutic techniques that target specific

mechanisms (e.g., emotional processing) may be unable to explain why a client drops out of treatment. Regularly utilizing conceptualizations to predict treatment barriers and other therapeutic interfering behaviors (as well as therapy-benefitting behaviors) could help researchers identify client-specific variables that may predict treatment failure.

A case conceptualization approach to research may help clinicians understand how to choose and apply specific interventions supported by RCTs. Exploring other research methodologies besides RCTs could provide useful information about the process of change in psychotherapy (Kazdin, 2011). Conceptualizations fit well with single-case designs in which researchers may systematically and rigorously control confounding variables to test for processes of change. RCTs may be useful when examining group comparisons and for understanding general efficacious principles, but clinicians are interested in treating the individual client (Eells, 2013). Expanding research methodologies to include case conceptualization will make research applicable and generalizable to real-world settings.

Overall, case conceptualization guides clinicians' judgment and how to best proceed with psychotherapy. Idiographic case conceptualizations may prevent some treatment failures, assist with complex cases involving comorbid disorders, help clinicians make treatment decisions, help researchers understand the processes of change, and improve the treatment quality delivered by psychologists. The benefits of a case conceptualization approach to psychotherapy are clear.

Pitfalls of Conceptualization

Case conceptualization also is a potentially harmful process, and clinicians must be cognizant of its limitations. Case conceptualization is a skill limited to the clinician, meaning that variability exists between clinicians (Westmeyer, 2003; Wilson, 1996). A number of reviews suggest that clinicians are fallible and prone to error and biases in conceptualizations (e.g., Garb, 2005; Wilson, 1996, 1997). Errors in clinical judgment, although expected, could lead to ineffective treatments or client deterioration in therapy. This section reviews the difficulties with case conceptualization.

First, there is a lack of research about case conceptualization despite many theoretical orientations espousing its importance. Case conceptualization approaches to CBT utilize the latest research and empirically supported constructs (e.g., Persons & Talbot, 2015). There are a great deal of theoretical publications describing how to use conceptualizations and the importance of conceptualizations (e.g., Bieling & Kuyken, 2003; Eells, 2013; Persons, 2012). However, there is little research on how to conduct this practice.

Case conceptualizations are developed, typically, by a single clinician based on information gathered in clinical interviews and assessments (Westmeyer, 2003). There is a vast amount of information that clinicians must assess and synthesize. Some clients do not fully disclose information (e.g., Hill & Gelso, 2000; Westmeyer, 2003), not all clinicians will ask the same questions in unstructured and semi-structured interviews, and not all clinicians weight the information obtained equally (Flitcroft, James, Freeston, & Wood-Mitchell, 2007). The variability in diagnostic and functional assessments may

lead to variability when conceptualizing causal and maintaining factors of a client's problems which would affect treatment decisions (Westmeyer, 2003).

Clinicians also vary in how they interpret the information gathered from interviews and assessments. Dawes, Faust, and Meehl (1989) reviewed that clinicians are prone to misjudging which information is important from an interview and other personal interactions. Case conceptualization requires intense cognitive effort for complex cases, as the clinician must look at the vast amount of collected information for patterns, hypothesize mechanisms, and synthesize the data into an evidence-based treatment plan (Persons, 2012). If no apparent pattern is relevant, then clinicians must conduct literature searches and consult with knowledgeable colleagues. Furthermore, clinicians should consider alternative conceptualizations and systematically test and assess for the validity of each conceptualization (Meier, 1999).

Case conceptualization relies on a clinician's judgment. Confirmation bias may lead clinicians to seek information related to a depressive episode because their primary care physician placed a client on antidepressants instead of assessing for other potential explanations for symptoms (e.g., alcohol use, bipolar disorder, bereavement). Clinical judgment is known to be inferior to actuarial predictions in psychology (e.g., Ægisdóttir et al., 2006). Dawes and colleagues (1989) suggested three ways in which clinical judgment may be flawed. First, incorrect predictions were related to clinicians basing their judgments on previous knowledge and experiences, most of which are neither confirmed nor disconfirmed. Second, clinicians were unable to know whether or not their judgment was correct to inform future judgments. Third, clinicians were unable to

weight differential information accurately. Dawes and colleagues demonstrated that statistics, such as regression analyses, were able to parse which variables are unique and how strong the relationships are with the dependent variable. As such, statistical analyses of clinical information may be more accurate than a clinician's judgment.

Clinical judgment errors occur, but the frequency and severity of these errors can be reduced with progress monitoring. Lambert, Harmon, Slade, Whipple, and Hawkins (2005) showed that clinicians who use progress monitoring tend to have better treatment outcomes. It is believed that the benefits of progress monitoring affect clinician behaviors. Clinicians who gather data about their client's progress can act in real-time to modify conceptualizations when trying to understand client deterioration (Persons, 2016). Progress monitoring facilitates the feedback-loop in the case-conceptualization approach to psychotherapy (Persons, 2012). That is, clinicians can use outcome data during the course of treatment to modify a treatment plan when a client is not improving. If a client seen for depression has severe symptoms and functional impairment after receiving a few months of treatment, then the clinician may need to modify the treatment plan or gather more information to understand why this particular client has not improved. Progress monitoring offers great utility for clinicians to quantitatively examine their improvement. Quantitative monitoring prevents the clinician's perception of therapy from being the only data points. Clinical judgment can be flawed, but the error can be reduced to improve therapeutic outcomes.

In summation, case conceptualizations are vulnerable to error when created by clinicians. Clinicians are subject to cognitive biases, such as the availability heuristic, that

may affect how a clinician perceives their client and how to integrate an overwhelming amount of information. It is difficult for clinicians to evaluate the validity of their conceptualizations, particularly when there is little to no feedback. Despite these difficulties, it seems there are ways to reduce the error in case conceptualization. First, integrating assessment data through progress monitoring during psychotherapy could inform clinicians whether or not their conceptualizations are valid, and help the clinician adjust therapy. Second, utilizing the latest research to understand general principles of behavior may prevent the clinician from using irrelevant information when treating clients. Relying on standardized assessments and progress monitoring may be the best way to reduce errors in clinical judgment.

Idiographic and Nomothetic Conceptualizations

There are two types of conceptualizations: nomothetic and idiographic. Nomothetic conceptualizations are general conceptualizations developed for broad groups of people. Nomothetic conceptualizations typically come from research protocols in which specific etiological factors and maintaining mechanisms are rigorously researched under highly controlled conditions. Idiographic conceptualizations apply psychological principles that a clinician believes are important to the individual case. Idiographic conceptualizations may draw upon literature, but an idiographic conceptualization typically integrates non-research-based information (e.g., specific events in a client's life) with theory of psychopathology. For example, a nomothetic conceptualization for depression based on behavioral principles would be behavior activation. Behavior activation identifies a lack of positive reinforcement as the

maintaining mechanism for depression (Martell, Dimidjian, & Harman-Dunn, 2010). The treatment plan for behavior activation subsequently focuses on increasing positive reinforcement in the client's environment using a variety of techniques (e.g., activity scheduling). An example of an idiographic conceptualization for depression may also hypothesize a lack of positive reinforcement as a maintaining mechanism. However, an idiographic conceptualization will also incorporate other factors such as a growing up in a rural community and recently moving to an urban area, lack of social relationships, distance from family members, a demanding new job, and a variety of other factors that could influence depressive symptoms.

When treatment is described as nomothetic or idiographic, it typically describes how a treatment is being conducted and the type of conceptualization treatment is based upon. Nomothetic treatments tend to use structured manualized approaches, and idiographic treatments tend to be more individualized in their approach. It is unclear whether or not treatment decisions based on idiographic conceptualizations, compared to nomothetic conceptualizations, are more effective at reducing client symptoms. The few studies conducted comparing individualized and standardized treatments demonstrated mixed results. However, the manualized approaches to therapy still incorporated some amount of individualization.

Persons, Roberts, Zalecki, and Brechwald (2006) examined whether or not case-formulation driven CBT was comparable to standardized treatment protocols to alleviate symptoms of anxiety and depression. They collected data from their practice, and, after selection criteria, had a sample of 58 patients. Results showed that patients

receiving the idiographic treatment reached statistically significant reductions in symptoms of depression and anxiety, and that the posttreatment scores were comparable to standardized treatments. Additionally, scores on the Beck Depression Inventory (Beck, Steer, & Brown, 1996) and Burns Anxiety Inventory (Burns, 1998) showed clinically significant improvement and recoveries comparable to empirically supported treatment outcome studies. From this study, using empirically supported principles derived from empirically supported treatments seems to be an effective method of treating psychopathology in an individualized format. However, Persons et al. were unable to find a superiority effect for an individualized treatment. This study demonstrated that an individualized treatment can be comparable to a standardized treatment for depression and anxiety.

Likewise, Emmelkamp, Bouman, and Blaauw (1994) found no difference between individualized and standardized treatments for OCD. The authors conducted a study to compare an idiographic treatment based on a functional analysis to a standardized OCD treatment protocol. Twenty-two participants were randomly assigned to the idiographic or standardized treatment of OCD (i.e., in vivo exposure). Idiographic treatment also included skills specifically tailored for the individual participant being treated and included skills such as cognitive restructuring, positive event scheduling, and assertiveness training. There was no statistical difference between the standardized and idiographic groups on any outcome measures but the researchers found a statistical trend in which the idiographic group reported fewer irrational beliefs than the

standardized in vivo exposure group. It seems that individualized and standardized treatments are similar in efficacy for OCD.

Ghaderi (2005) conducted a study that compared a manualized CBT protocol for bulimia nervosa to an individualized version of CBT based on a functional analysis. Fifty participants were recruited and randomly assigned to the manualized or individualized treatment conditions. Both groups had a maximum of 19 sessions available to them. Results suggested that the manualized protocol and functional analysis produced the same amount of change at post-treatment and follow-up on the majority of outcome measures with exception of three. Functional analysis was superior to manualized CBT for abstinence since last binge episode, eating concerns, and body shape dissatisfaction. However, these differences were small. It seems that both idiographic and standardized treatments perform similarly. Notably in this study, there was a greater proportion of treatment nonresponders in the manualized treatment group as compared to the individualized functional analysis group. Thus, it may be that individualized treatments are better able to assist in client participation. Again, the evidence shows that individualized and standardized treatments produce similar client outcomes.

Schulte, Kunzel, Pepping, and Schulte-Bahrenberg (1992) compared an individualized treatment to a standardized treatment for specific phobia. Patients were randomly assigned to an individualized treatment group, a manualized control group, and a yoked-control group that received the same modified treatment as the experimental group. The sample consisted only of phobic patients with no other DSM-III diagnosis. The sample consisted almost entirely of agoraphobia patients in which most

had an additional simple phobia. The study used 28 therapists with a range of experiences with a median experience level of 9 prior patients, ranging from 0 to 200 prior patients. Interestingly, there was no outcome difference between the individualized treatment and the yoked-control treatment, but that the standardized treatment outperformed the individualized and yoke-control treatments. To explain their findings, the authors suggested that the greater reliance on evidence-based methods (e.g., exposure) was the reason for the symptom improvements, and this is why the standardized treatment performed better at post-treatment. The authors also found that treatment was tailored in many cases of the manualized treatment, but that the therapists noted it was necessary. The authors posit that in vivo exposure was the primary variable that led to symptom improvement in this sample of phobic patients. It is unclear what the results would be if more experienced clinicians were used, or if comorbid disorders aside from anxiety disorders would be included. The authors found a slight difference on treatment outcome between experienced (i.e., more than 19 clients seen) and inexperienced (i.e., less than 19 clients seen) therapists at 2-year follow-up, but there was no difference between therapist experience levels at post-treatment or 6-month follow-up. This study provided evidence that standardized treatments may outperform individualized treatments in some cases; however, this study also demonstrated that even in manualized approaches there are still individualized portions (e.g., pacing of exposure, items on a fear hierarchy).

Nelson-Gray, Herbert, Herbert, Sigmon, and Brannon (1989) compared matched, mismatched, and packaged treatments for depressive disorders. A total of 9 participants

were randomly assigned to the three treatment conditions. The authors implemented a multiple-baseline design across subjects within these conditions. The authors concluded that matched (i.e., individualized) treatments were effective at reducing symptoms of depression, and that treatment packages were more effective than individualized treatments. However, the matched treatment group began with significantly higher levels of depression, as measured by the Beck Depression Inventory (Beck, Steer, & Brown, 1996), at baseline. Also, one individual in the packaged treatment group was already trending towards improvement during the baseline condition. This study provided some evidence that manualized treatments may be better than individualized treatments. Unlike the Persons and colleagues (2006) article, this article presented data that favored the manualized treatment over the individualized treatment. The efficacy of individualized treatments for depression has mixed results.

The limited research in this area (i.e., 5 studies) comparing individualized and standardized treatments makes it particularly difficult to fully evaluate which is more effective. This is important for case conceptualization because conceptualizations typically are a key component of individualized treatments for guiding treatment decisions. It seems that individualized treatments are as effective as standardized treatments for treating anxiety and depression. In some cases, the individualized treatments outperformed the standardized treatments. The studies presented typically suffer from a small sample size, are underpowered to examine their research questions, and may be unable to find effects due to the low statistical power. The variability between these studies may reflect that individualized treatments are better on some

outcome measures (e.g., time since last binge episode for bulimia nervosa). It may be that standardized protocols tend to be more effective with simple disorders and idiographic conceptualizations are better for complex cases. However, there is no research examining this question. There is simply not enough research in this area to make a scientifically informed judgment. It seems that individualized and standardized treatments are equivalent for most treatment outcome variables. Also, most manualized approaches described in these studies above incorporated some individualization for the client. This includes the therapist's ability to restructure thinking errors, or design exposures towards fearful stimuli in many cognitive-behavioral protocols. Conceptualizations help clinicians operate within the moment and to apply the standardized protocol. Case conceptualization's importance for treatment planning and decision making seems axiomatic, but little empirical research has fully explored these questions.

Perceptions of Case Conceptualization

In most models of case conceptualization, formulating the case is a collaborative process (e.g., Kuyken, Padesky, & Dudley, 2008; Persons, 2012; Wright, Basco, & Thase, 2006). Collaboratively developing conceptualizations with the client offers an explanation for their symptoms which may benefit the alliance. However, research on the benefits is nuanced. Most clients perceive both positive and negative reactions to hearing a clinician's conceptualization of their problems (Chadwick, Williams, & Mackenzie, 2003; Evans & Parry, 1996; Pain, Chadwick, & Abba, 2008). Some clients

report more positive aspects of conceptualization than others, which may demonstrate a moderating variable that determines how clients perceive the conceptualization.

Redhead, Johnstone, and Nightingale (2015) examined clients' qualitative responses to case conceptualizations. The authors used a semi-structured interview and inductive thematic analysis. Ten clients with a diagnosis of depression, anxiety, or both participated in the study. Participants were interviewed at the end of the course of therapy about case conceptualization with questions such as: was an explanation developed, when and how it was developed, the participant's thoughts of the conceptualization, if their responses changed over time, and how helpful they felt the conceptualization was. Four themes were identified: 1) Conceptualization helps me to understand my problems; 2) Conceptualization leads to feeling understood and accepted; 3) Conceptualization leads to an emotional shift; and 4) Conceptualization enables me to move forward. The authors suggested that the formulation process can improve therapeutic alliances. They also found that some participants had negative reactions to case conceptualizations, and were tearful even at the end of treatment. The authors explained that negative experiences might arise when the clinician creates conceptualizations outside of the therapy session and presents it to the client, when the case conceptualizations are incorrect, or when the conceptualization challenges the client's self-identity. From this study, it seems that clients have mixed views of conceptualization, and it is unclear what makes it helpful for some clients. However, the induction of negative experiences may not necessarily reflect a case conceptualization

as being unhelpful. Rather, it may reflect the accuracy of targeting a client's problems, and elicit affect related to the problem.

Pain, Chadwick, and Abba (2008) also conducted a qualitative study to examine client reactions to case formulation. Thirteen clients suffering from various psychotic disorders participated in semi-structured interviews to understand their reactions. The clients experienced positive (e.g., hopefulness, anticipated clinical improvement), negative (e.g., difficult to process, worry), and neutral reactions (e.g., believe of no benefit). The majority of reactions were positive or negative. Overall, clients experienced equally positive and negative reactions to case conceptualization. However, it is unclear from this study why there were negative reactions to case conceptualizations and the authors explained that negative schemas might be activated when clients are presented with a case conceptualization.

Chadwick, Williams, and Mackenzie (2003) evaluated the effects of case formulation on the therapeutic alliance and symptom distress. In a sample of 16 individuals suffering from psychotic disorders, the authors collected baseline data of the alliance and distress. Following baseline, a case formulation was presented to the client. Results showed that case formulation did not improve a client's perception of the therapeutic alliance, but improved the therapist's perception of the therapeutic alliance. Additionally, there was no change in symptom distress when the case conceptualization was presented. The majority of clients found case conceptualization helpful, but about half reported at least some negative responses to the conceptualization.

In a follow-up experiment in the same publication, Chadwick and colleagues also examined distressing delusions and negative beliefs about the self as outcome variables. The authors allowed 4 sessions to collect information to build a case conceptualization. For this experiment, the authors used a multiple-baseline design with 4 participants. All participants received cognitive therapy for psychosis. Again, case formulation had no effect on the client perception of the therapeutic alliance, and it had no effect on negative beliefs about the self or delusions. This study again demonstrated the mixed reactions that clients have to conceptualizations, and that only therapists perceive an increase in therapeutic alliance once the conceptualization has been shared.

In a small sample of individuals who had failed to benefit from other therapies, Evans and Parry (1996) examined client perceptions of case conceptualization in the context of cognitive-analytic therapy. Presenting the case conceptualization to the client had no effect on perceived helpfulness, symptom improvement, or the therapeutic alliance. They found that three of four clients had symptom improvement over the course of treatment, but it was not related to the introduction of the case conceptualization. The clients reported during semi-structured interviews that they found the presentation of case conceptualizations to be an emotionally powerful experience and that it was largely a positive experience. Although clients find conceptualization a positive experience, it does not seem that sharing the case conceptualization affects therapy outcome.

A limitation in this area of research is the small samples of clients used, and the limited range of disorders (i.e., 2 studies on psychosis, 1 on borderline personality, and 1

on depression). The results of the previously mentioned studies suggest that sharing a conceptualization is unrelated to the therapeutic alliance for clients, but seems to be related to improving the therapist perception of the therapeutic alliance. Sharing conceptualizations also elicits both positive and negative affectual responses for clients. As such, disclosure of the conceptualization does not affect typical treatment outcome variables (e.g., symptom reduction). However, it may have different effects for clients with other forms of psychopathology. Overall, this research does not seem to support clinical recommendations to collaboratively develop and always share conceptualizations with clients (e.g., Kuyken, Padesky, & Dudley, 2008). Future research in this area should examine the effects of case conceptualization with larger samples, well controlled studies, and with a greater variety of presenting problems.

Reliability and Validity of Case Conceptualization

A number of methodological and conceptual problems have been identified in research on case conceptualizations. Reviews of case conceptualization demonstrate that interrater reliability is variable between raters across various presenting problems, ranging from low to high interrater reliability (Bieling & Kuyken, 2003; Flinn, Braham, & das Nair, 2015). Flinn and colleagues noted that psychodynamic conceptualizations tend to have greater interrater reliability, but that the methods of calculating interrater reliability may inflate this finding. Flinn and colleagues also noted that the majority of studies in this area examined trainee's ability to conceptualize. It is hard to expect that students first learning how to conduct therapy and conceptualizing their cases will be adept at writing reliable case conceptualizations. Further, the validity of case

conceptualization is difficult to establish because the effectiveness of case conceptualization is intertwined with the efficacy of intervention techniques, the therapist's ability, and the common factors of therapy. Along with these methodological difficulties, clinicians are notably poor at writing quality case conceptualizations (Kuyken, Fothergill, Musa, & Chadwick, 2005). The difficulty measuring validity and the poor quality of case conceptualizations make evaluating the effectiveness of idiographic conceptualizations complex.

A handful of studies examined interrater reliability for case conceptualization for clinicians, most of which was conducted with psychodynamic conceptualizations. Four studies examined cognitive or behavioral case conceptualization interrater reliability, and found that reliability is moderate between raters, but that training can improve interrater reliability in case conceptualization.

Persons, Mooney, and Padesky (1995) examined the interrater reliability of cognitive-behavioral case conceptualizations. They presented audiotapes of two clients' first sessions to 46 different therapists. Participants created a problem list and a list of underlying cognitive mechanisms for each client. Results suggested that cognitive-behavioral therapists have moderate agreement when developing a problem list, and have good interrater reliability when hypothesizing cognitive mechanisms when averaged across 5 raters. Demographic variables were unrelated to case conceptualization.

In a follow-up study, Persons and Bertagnolli (1999) aimed to replicate and improve on the findings of the Persons et al. (1995) study. To increase the reliability,

three modifications were made in this replication: a problem-list training system (Nezu & Nezu, 1993), anchors to the schema ratings, and a specific context for the ratings. The authors used an almost identical procedure with audiotaped sessions. Participant clinicians generated a list of problems, and then rated a list of specific schemas on relevance to a client. The authors coded the problem list and noted excellent interrater reliability. Participant clinicians correctly identified 67% of a client's problems on a problem list. Regarding schema ratings, participants were not better at identifying schemas in a context than with no context. Participants with Ph.D. level training were more accurate at identifying problems. However, no demographic variables were related to accuracy with identifying schemas. To improve the poor reliability with identifying schemas, the authors suggest that during training supervisors should explicitly state types of schemas that may be important for specific problems in specific contexts.

To further examine clinicians' ability to conceptualize cases, Kuyken, Fothergill, Musa, and Chadwick (2005) conducted a study in which participants created conceptualizations using the Beck Case Conceptualization Diagram method (Beck, 1995). They recruited 115 mental health practitioners of varying professions. Participants wrote a conceptualization for the same case, and these conceptualizations were coded using the Quality of Cognitive Case Formulation Rating Scale (Fothergill & Kuyken, 2002). Results showed that mental health practitioners were reliable at identifying relevant childhood experiences, core beliefs, and compensatory strategies, but were poor at agreeing on the dysfunctional assumptions. When examining the quality of the

conceptualizations, the researchers found that less than half of the sample (44.2%) produced “good enough” conceptualizations. Quality of case conceptualization increased with therapist experience. Overall, good reliability was achieved between clinicians, but that the reliability decreased when more theoretical inference was needed. This study demonstrated that clinicians can write reliable conceptualizations when given a specific method to follow, but the quality is still variable.

The validity of case conceptualization may also be important for treatment outcomes. Mumma (2011) reviewed the literature on the validity of case conceptualization, found few empirical studies, and offered suggestions for better research case conceptualization validity. Like all constructs, case conceptualization validity has multiple components, such as construct and predictive validity. Construct validity, including convergent and divergent validity, of case conceptualizations refers to whether or not the conceptualization measures the actual mechanism maintaining the client’s problems. Predictive validity may be demonstrated by tracking variables of interest over time during stressful events. Predictive conceptualizations may also demonstrate greater treatment effectiveness, but there are many factors that affect treatment outcome (Mumma, 2011). Mumma also suggested that predictive validity of conceptualizations should be based on nomothetic data, and that idiographic conceptualizations may add incremental predictive value to understand moderating and mediating variables that amplify or mitigate psychological distress. Mumma noted a need for more studies examining the validity of idiographic conceptualizations, and suggested clinicians use repeated-measures designs to gather data at multiple time

points per day to evaluate the conceptualization. A small handful of studies have examined case conceptualization validity.

Mumma and Smith (2001) recruited graduate students to create situation-specific conceptualizations based on cases and then used 10 participant clinicians to evaluate the likelihood of the conceptualizations. Conceptualizations were found to be reliable between raters, but only when the mean was averaged across the 10 raters for intraclass coefficients. Results also suggested that case conceptualization was conceptually distinct in convergent and divergent validity for different clients. Specifically, two individuals suffering from depression were found to have different mechanisms maintaining their depressive symptoms in this study. Also, situational-specific conceptualizations can be reliable and valid both within and between clinicians. This is one of the few studies that examined situation-specific conceptualizations instead of overarching case-level formulations, and demonstrated construct validity.

Mumma (2004) conducted another study on the validity of conceptualizations. In this study, Mumma conducted an interview with a real-world client suffering from depression, hypothesized four cognitive schemas, and collected daily data related to the four hypothesized schemas. In addition to the individualized assessment, Mumma also collected data on depressive and anxious symptoms using existing measures. Mumma found that the cognitive schemas predicted distress beyond the standardized assessments. Mumma argued that this demonstrated incremental validity of individualized case conceptualizations in addition to standardized conceptualizations.

Overall, this study provided quantitative data that individualized assessments based on conceptualizations may be helpful to predict treatment progress.

Additionally, Mumma and Mooney (2007) conducted a study comparing the case conceptualizations of an expert and a novice for a real clinical case. One doctoral student and one expert clinician watched the same video tapes of a clinical interview and developed a case conceptualization using cognitive schemas. After hypotheses were made, the patient was provided treatment while tracking the severity and frequency of the hypothesized mechanisms and symptoms of the presenting problems. Mumma and Mooney found that the expert's hypothesis maintaining problems was better related to symptom reduction than the novice's hypothesis. They argued that this demonstrated construct validity because experts should be more effective at case conceptualization than novices. This study was unique in that it compared two different conceptualizations and tracked symptoms related to each conceptualization at multiple time points. This study demonstrated that it is possible to assess the validity of alternative hypotheses for treatment.

To sum, the reliability for cognitive-behavioral case conceptualizations is mixed, but tends to be satisfactory. The quality of case conceptualizations written by practicing clinicians tends to be fair, and the validity of case conceptualizations has some supporting evidence but is difficult to test. Also, the majority of these studies examined anxiety and depressive disorders. It is unclear how reliability and validity would be affected by conceptualizations for less-common disorders. Reliability and validity are critical questions necessary to understand if idiographic treatments target the

appropriate mechanisms. If different clinicians hypothesize different mechanisms, it is difficult to understand which clinician is correct and which treatment plan to implement. However, there may be more than one correct or helpful conceptualization for a given client (Bergner, 1998). Although validity is difficult to test, some studies have demonstrated construct and predictive validity for idiographic conceptualizations by tracking hypothesized mechanisms at multiple time points (e.g., Mumma, 2007). Overall, the field seems to be moving towards better understanding of validity issues in conceptualization, but it is not well-researched at this time.

Clinician Experience and Case Conceptualization

Clinician experience was found to predict reliability and validity in case conceptualizations (e.g., Kuyken, Fothergill, Muma, & Chadwick, 2005). It seems plausible that experience would also be related to the quality of case conceptualization. Three studies examined therapist experience and quality of conceptualization, two of which also examined theoretical orientation as a moderating variable. As expected, experts tend to write more quality case conceptualizations than novices and experienced clinicians. However, some evidence suggests that novices write higher quality conceptualizations than experienced clinicians (Eells, Lombart, Kendjelic, Turner, & Lucas, 2005).

Eells and Lombart (2003) examined novices, experienced clinicians, and expert clinicians from both psychodynamic and cognitive-behavioral theoretical orientations. Expert clinicians were defined as individuals who have given workshops on case formulation or published work on case formulation. Experienced clinicians had at least

10 years of psychotherapy experience. Novices were clinicians still in graduate school and typically in their 3rd year of graduate training. Participants rated a series of vignettes on various qualities. Participants constructed a case conceptualization and treatment plan immediately after listening to an audio recording of a vignette through the telephone. Participants reported that the vignettes had adequate information to construct a case conceptualization. Participants were asked to rate the importance of 11 case conceptualization factors: demographics, symptoms/problems, precipitating factors, history of mental health care, childhood, adolescence, past adult stressors, coping/defense style/behaviors, mental status, treatment obstacles, and strengths. Participants rated symptoms/problems, precipitating stressors, coping/defense styles, and childhood history as the most important factors, respectively. There were no differences between theoretical orientations in difficulty of conceptualizing the case or developing a treatment plan. However, therapist experience affected perceptions of important components for conceptualization. Novices and experts tended to rate the importance of the 11 factors more similarly to each other than to experienced clinicians. The authors explained that novices and experts may tend to agree more because expert supervisors teach the novice graduate students, whereas experienced therapists no longer receive direct training from expert therapists in conceptualization.

In a follow-up study using the same sample, Eells, Lombart, Kendjelic, Turner, and Lucas (2005), evaluated the quality of the case formulations that the 65 clinicians audibly reported. The authors hypothesized that expert clinicians would have higher quality case conceptualizations than novices. These authors used the Case Formulation

Content Coding Method (CFCCM; Eells, Kendjelic, & Lucas, 1998) to code the quality of case conceptualization. They added 4 hierarchical categories to the CFCCM for this study: descriptive, inferential, diagnostic, and treatment planning. Statements by the participants were coded into these four categories by multiple raters, and interrater reliability ranged from fair to good. Eight qualities were examined for case conceptualization quality: comprehensiveness, formulation elaboration, precision of language, complexity, coherence, goodness-of-fit to treatment plan, treatment plan elaboration, and a systemic process to develop a conceptualization for all 6 vignettes. They found that experts produced the highest overall quality of case conceptualizations, followed by novices, and that the lowest quality conceptualizations were produced by experienced clinicians. The authors posited that novices might be better than experienced therapists because the experts were directly teaching the novices whereas experienced therapists have been away from experts for some time. However, this sample is small. Little is known about the change over time for novices as they become experienced therapists and why their ability declines post-graduation. The rate of decline in case conceptualization ability is also unknown.

To examine the importance of case conceptualization for treatment decision making, Dudley, Ingham, Sowerby, and Freeston (2015) conducted two experiments. In the first study, the authors created a case conceptualization vignette and asked participants, who were students and experienced clinicians, to develop a treatment plan based on the conceptualization. The authors examined formulation type and experience as their within and between group variables, respectively. Participants were given basic

intake information, a completed thought record, a completed activity schedule, and a written cognitive theory case conceptualization. This information was given for two different case vignettes. The first study found that experience did not affect the ability to use information in treatment planning, and that participants tended to use the relevant treatment options based on the case conceptualization. In the second study, the authors used a new sample and examined the ability for novices and expert clinicians to write conceptualizations and then use them for treatment planning. The second study found that experts made fewer errors and better quality conceptualizations than the novices. This study examined individuals with very little clinical experience (i.e., a mean of 4 cases per student). It is unknown how advanced students would compare to experts and novice students when creating and using case conceptualizations.

The research suggests that there is a connection between experience and the quality of case conceptualizations. Experts are better than novices in case formulation, which suggests that this ability improves over time. Interestingly, some evidence suggests that novices may write better conceptualizations than experienced clinicians (Eells et al., 2005). Yet, little is known about the process of change for how novices' conceptualizations develop after licensure or even during graduate training, and how or why it may deteriorate after graduate school. Further, it is unknown how a novice's first conceptualization to their last conceptualization in training changes. Research in this area might reveal important training considerations to more readily teach novices case

formulation, and subsequently reduce deterioration of experienced therapists' conceptualizations.

Training Conceptualization

One purpose of graduate training programs is to help student therapists become competent in the assessment and treatment of mental health, including case conceptualization (Meier, 1999). It is unclear if there are any specific characteristics that predict student therapist success or competency in clinical psychology doctoral programs. However, verbal, quantitative, and analytic Graduate Record Examinations (GRE) scores tend to predict academic outcomes such as: first year grade point average, research productivity, and degree attainment (Sternberg & Williams, 1997; Kuncel, Hezlett, & Ones, 2001). It is unknown if GRE scores would predict practical outcomes such as how clinicians apply psychological knowledge to develop case conceptualizations. As a whole, student therapists write poor conceptualizations, but cross sectional research suggests that conceptualization ability may improve over time (Eells et al., 2005). The developmental process of case conceptualization is unknown, and there is little empirical literature that demonstrates effective teaching methods for case conceptualization. Yet, there are many published resources for how to teach case formulation to trainees. Only one study to date has examined a specific training program and measured the quality of case conceptualization; however, other studies have used case conceptualization workshops to improve interrater reliability of participants (e.g., Persons & Bertagnolli, 1999).

Kendjelic and Eells (2007) aimed to create a generic, transtheoretical training program to improve case conceptualization quality. They identified four components that are important for a generic case formulation: a) symptoms and problems, b) precipitating stressors, c) predisposing events and conditions, and d) inferred explanatory mechanism. There were 43 participants in the study from various fields of mental health: clinical or counselling psychology, psychiatry residents, medical students, social work students, credentialed social workers, and a registered nurse. Participants were randomly assigned to receive a case formulation training program or a no-training control group. Training included a 2-hr group presentation with lecture and practice formulating conceptualizations. A manipulation check of learning was administered and indicated that the participants understood the training material. Up to 30-days after training, two to three conceptualizations for real-world clients were examined per participant. These conceptualizations were acquired from client files. The CFCCM was used to code the quality of case conceptualizations. Independent raters were trained to criterion, and had good reliability. On a scale of 1 to 5, the mean quality ratings were 2.78 for the training group and 1.36 for the control group, indicating that the training seems to have improved case conceptualization quality. However, the quality of conceptualizations was still notably poor. Furthermore, the case formulations that were rated were created within 30 days of the training program (at consent for the control group). It is unclear how long the training effects last. Additionally, about 75% of the sample were students at varying points in training. It is unclear how the time effects of training may affect the conceptualization quality, if the notably poor conceptualizations

will improve over time naturally, and whether training facilitates that improvement.

However, the authors found that there was no relation between experience and case formulation quality. Aside from this one quantitative study, other published models exist for training case conceptualization.

There are various training models for case conceptualization. A number of themes emerge from these models: Creation and use of conceptualization diagram, ongoing supervision, and peer feedback. Case formulation is a cognitively taxing process that requires immense effort from both the supervisee and the supervisor. Courses have been devoted to teaching case conceptualization (e.g., Osborn, Dean, & Petruzzi, 2004), but the efficacy of these courses and models is largely unknown. Below is a brief overview of some training models for improving case conceptualization.

Ellis, Hutman and Deihl (2013) aimed to create a theory-driven approach for teaching case conceptualization skills to trainees. Their method, called the Chalkboard Case Conceptualization approach, was founded on cognitive developmental theory to address supervisee skill deficits. Using visual diagrams, various aspects for conceptualization are reviewed by the supervisor and supervisee (e.g., presenting problems, thoughts, feelings, behaviors, culture, medication). The supervisor assists the supervisee to identify causal links by drawing connecting lines between the components. The supervisor elicits supervisee knowledge about the theory and application of treatment and problems to facilitate identifying causal factors. Chalkboard case conceptualization is typically a 1 - 2 hour process. Although based in

theory, there is no quantitative evidence that this method improves supervisee case conceptualization ability.

Liese and Esterline (2015) focused primarily on the supervisory process to improve conceptualization similar to the Chalkboard Case Conceptualization method. They described a four step process of concept mapping: 1) Trainee creates a problem list and identify thoughts, feelings, and behaviors with the client; 2) Trainee hypothesizes mechanisms; 3) Trainee and supervisor meet to discuss underlying psychological principles that cause or maintain the problems; and 4) Trainee discusses the concept map with the client in session. Once again, however, there is no supporting evidence for this method in successfully helping trainees learn case conceptualization.

Osborn, Dean, and Petruzzi (2004) designed a course to teach idiographic case conceptualizations to counselling students. The course used client actors and treatment teams to facilitate case formulation and treatment plans. Student perceptions of the course, obtained from their end-of-semester evaluations, were mixed. Many students reported receiving benefit from the course projects, but many also described it as an overly burdensome process. After all, the students only wrote one conceptualization over the entire course. This study uniquely gathered student perceptions about learning case formulation. Yet, one weakness of this study was that the authors did not report on the quality of these conceptualizations. It is unknown whether this is an effective approach to help students learn how to formulate conceptualizations.

Page, Stritzke, and McLean (2008) developed a more complex, integrated training model for conceptualization, which they called a science-informed training

model for case conceptualization. This multistep process was designed to help clinical psychology students understand the supervision process before treating their first client. Novice students first observed supervision of senior students. Once the trainees completed sufficient coursework, they began to see clients and undergo the supervision process. At the end of their second year, trainees stopped seeing clients, but continued to engage in supervision to more fully understand the process of supervision without the cognitive burden of treating clients. In addition to direct supervision, the authors introduced two workshops to facilitate the supervision process. The first workshop taught trainees what to expect from supervision and how to utilize supervision. This first workshop was conducted before seeing their first clients. The second workshop taught trainees to be supervisors. To evaluate the efficacy of case conceptualization in their trainees, trainees wrote a case conceptualization for a case vignette. Page and colleagues created their own method for assessing the quality of the case conceptualizations. They determined that higher quality conceptualizations matched the expert clinician's conceptualizations. When comparing two raters, the authors found moderate agreement on the quality of case conceptualizations. However, no data on student performance were provided. It seems that students can be trained to write conceptualizations similar to supervisors, but the overall quality of student conceptualizations is unknown.

Meier (1999) developed a teaching method for integrating case conceptualization with assessment and intervention processes. Meier presented four principles that students should use during case formulation: Link model to theory and

research; Parsimony; Consider alternative explanations; and Represent models visually.

The first principle to link theory and research is to base hypotheses on empirical information. Parsimony refers to creating a simple model that captures the client's symptoms. Considering alternative explanations allow clinicians to explore and deepen their conceptualizations while limiting confirmation bias. Representing models visually helps students organize information. Meier taught these principles to 131 students and examined their conceptualization ability and self-efficacy of their ability after four training sessions. Meier found that student's self-efficacy increased after the program. He also noted that more skilled students tended to be flexible in their approach, and attended to client and personal emotion, thoughts, and behaviors. However, the lack of control group makes it difficult to infer that any of these improvements were directly attributable to a specific training model or simply the effects of time. Nonetheless, this was one of the few methods that have at least some quantitative support.

The literature on training case conceptualization has many areas for improvement. First, there is a lack of quantitative and qualitative data on case conceptualization training. Most papers are theoretical or anecdotal with only two studies collecting any data (Kendjelic & Eells, 2007; Meier, 1999). The lack of data applying makes it difficult to evaluate the quality of teaching for case conceptualization, and more research is needed.

The training models for teaching conceptualization are remarkably similar. Almost all of the methods incorporate diagrams into the training and supervision process for case conceptualization. There are some differences in the quality and

amount of direct feedback, but the methods all begin with an educational component in which students either receive didactic or observational training through watching advanced students. However, the majority of methods for teaching case conceptualization to beginning therapists lack quantitative assessments to support them. The underlying assumption is that teaching these skills is better than not teaching these skills. There is a need to ensure the efficacy of training programs, and to better understand the process of change of graduate student therapists as they advance in their training. However, there is no research investigating case conceptualization ability over time.

Statement of the Problem

The literature reviewed demonstrated a number of key gaps in the research on case conceptualization and training issues. First, there is little empirical research on the efficacy of teaching case formulation to students. It is unknown if certain training methods outperform others, or if there is an optimal training method. Further, the trajectory of learning (e.g., linear, quadratic) case conceptualization is unknown. It is unknown why case conceptualization ability seems to decline post-graduation. Lastly, the initial ability of first-time therapists is also unknown.

The present study aimed to answer some these questions to improve the case conceptualization literature and inform the University of Nebraska-Lincoln (UNL) clinical psychology training program (CPTP) about the quality of conceptualizations of their students. The following hypotheses guided the current investigation:

Hypotheses

H1: Clinical psychology graduate therapists will improve the overall quality and complexity of their case conceptualizations over time after controlling for supervisor.

H2: Higher quality of conceptualization will be associated with higher GRE scores after controlling for supervisor.

H3: Lower conceptualization quality will be associated with greater likelihood of premature treatment termination.

CHAPTER 2: METHOD

Design Overview

This study examined how case conceptualization changes during the course of graduate school for clinical psychology student therapists. The design of this study was archival. This study examined written documents that contained case conceptualizations that were available from the records of the Psychological Consultation Center (PCC) at the University of Nebraska-Lincoln. Therapist factors that were believed to affect quality of case conceptualization were also gathered. Students at the UNL CPTP were required to treat multiple clients in the PCC during their second year, and so the majority of data occurred for students in their second year. In all other years of training, most students do not treat clients or write conceptualizations in the PCC general clinic, but continued to see clients in other specialty clinics and practicum sites. However, all students in the UNL CPTP saw multiple clients in the PCC during their training. As such, this made the PCC the optimal place to measure case conceptualization ability for students to understand their growth throughout graduate training.

Participants

Participants were graduate students of the UNL CPTP from 2009 to 2016 who saw clients at the PCC during these years. There were 63 therapists during these years. An invitation to participate was extended to all students that had completed both semesters of the second year practicum course (Clinical Intervention). Students who

began the UNL CPTP program in the 2012 academic year were excluded because the PI was a part of this cohort. Given the inclusion and exclusion criteria, 44 student therapists were approached for recruitment. Informed consent was obtained from 27 student therapists. Because the principle investigator (PI) was also a student and knew all of the participants, an undergraduate research assistant managed the consent process and the sensitive data (e.g., GRE scores) provided by therapists. Participants were informed that they were free to withdraw consent from the study at any point. Participants were instructed to contact the PI with any further questions regarding the study.

The student therapist participants were at least 2nd year graduate students, but could be as senior as 7th year graduate students. Participants were an average of 24.6 years old when they entered the UNL CPTP. The majority of participants were women ($n = 18$; 66.7%) with one third men ($n = 9$; 33.3%), and the majority ethnicity was white ($n = 22$; 81.5%) with a small number of ethnic minorities ($n = 5$; 18.5%). The majority of participants only had a Bachelor's degree when they began the CPTP ($n = 22$; 81.5%), two individuals (7.4%) entered with a master's degree in clinical or counseling psychology, and three individuals (11.1%) entered with a Master's degree in another field. About half ($n = 13$; 48.1%) of the participants had no clinical training prior to their admission in the CPTP, with the remainder of participants either working in mental health settings ($n = 8$; 29.6%), administering psychological assessments ($n = 2$; 7.4%), or both ($n = 4$; 14.8%). For the GRE, 21 participants completed the old version and 6 participants completed the revised version. The following GRE scores were converted to

the new GRE scale. The average verbal GRE score was 160.5 ($SD = 6.8$). The average quantitative GRE score was 154.6 ($SD = 5.8$). The average analytic GRE score was 4.85 ($SD = 0.67$).

Informed consent was also obtained from clients whom the above therapists treated. During intake, clients were informed and consented that their file and all associated data may be used for research purposes. There were 1049 clients that were seen from 2009 – 2016. It was estimated that 900 of these had an assessment and treatment plan eligible for review. To narrow the scope of data collected, only clients seen by students in the PCC general services and the Anxiety Disorders Clinic were reviewed and only individual therapy clients were included. Individuals seen for group therapy, family therapy, and couples therapy were excluded from this study. Further, only adult files were examined; minors were excluded from the study. Occasionally clients were seen who had a prior relationship with a staff member or therapist in the PCC and their files were marked *confidential* which indicated only the therapist, supervisor, and perhaps clinic director can view the file. These files ($n < 10$) were excluded from the study. It was estimated that there were 650 files that met inclusionary criteria. Five conceptualizations for each of the 27 therapists were randomly selected for coding. Random selection was stratified across year in the program to ensure adequate conceptualization data was collected from multiple time points in training. In total, there were 110 conceptualizations that met inclusionary criteria and were coded.

Clinical Records

One hundred ten clinical records were included in the study. Of these clients, roughly half were women ($n = 63$; 57%), slightly less than half were men ($n = 45$; 41%), and two transgender or gender nonconforming people ($n = 2$; 2%). The average age of clients was 35 years ($SD = 13$), and age ranged from 19 to 70 years old. The majority of the clients were white ($n = 100$; 91%) with smaller samples of Latino ($n = 5$; 4%), Asian ($n = 2$; 2%), and other ($n = 3$; 3%) ethnicities. Most clients identified their sexual orientation as heterosexual ($n = 100$; 91%) with smaller samples of gay/lesbian ($n = 5$; 4%), bisexual ($n = 4$; 4%), and other ($n = 1$; 1%) sexual orientations. The clients received a variety of diagnoses, of which the most common were Major Depressive Disorder ($n = 25$; 15.4%), Social Anxiety Disorder ($n = 19$; 8.6%) and Adjustment Disorder ($n = 14$; 8.6%). The majority of clients were diagnosed with an active single mental disorder ($n = 62$; 56%) with about a third of the clients having two or more clinical diagnoses ($n = 34$; 31%). A small sample of clients were also diagnosed with V-codes (e.g., bereavement; $n = 16$; 14%). Rarely, a client was also diagnosed with mental disorders in full remission ($n = 6$; 5%). All clients were seen in either a general clinic ($n = 98$; 89%) or a specialty anxiety disorders clinic ($n = 12$; 11%). The average number of sessions in the general clinic was 16.7 ($SD = 13.8$) and 17 ($SD = 10.5$) in the anxiety disorders clinic. There were a total of 9 supervisors across the two clinics.

Measures

Case conceptualization.

Case Formulation Content Coding Method. To assess the primary variables of interest, a modified version of the Case Formulation Content Coding Method (CFCCM; Eells, Kendjelic, & Lucas, 1998) was used. The original CFCCM measures the quality of written case conceptualizations through a multistep process. First, conceptualizations are separated into idea units, which are typically a sentence or clause long. Each idea unit is then coded into a categorical system. There are four broad categories (i.e., descriptive information, diagnostic information, inferred information, and treatment planning), and each category has numerous subcategories to distinguish the content of information described by a therapist. After idea units are separated and coded, the quality of the conceptualization is coded across several domains: complexity, precision of language, coherence, systematic process, goodness-of-fit between treatment plan and conceptualization, elaboration of treatment plan, and an overall quality rating. Each quality rating is scored on a four point Likert-type scale. The CFCCM has good interrater reliability when coding idea units ($k = .86$), and acceptable to good interrater reliability when rating the quality of formulations ($k = .72 - .81$; Kendjelic & Eells, 2007). There is little research on the validity of the CFCCM, but experts tend to have higher quality conceptualizations than novices (Eells et al., 2005).

Two other manuals exist for assessing the quality of case conceptualizations: the Quality of Cognitive Case Formulation Rating Scale (QCCFRS; Fothergill & Kuyken, 2002), and the Collaborative Case Conceptualization Rating Scale (CCC-RS; Padesky, Kuyken, &

Dudley, 2011). The QCCFRS was not be used because it is exclusively limited to cognitive principles (e.g., schemas) and was not appropriate for other mechanisms (e.g., negative reinforcement). The QCCFRS also focuses exclusively on inferential information, and does not measure how a clinician integrates non-cognitive information (e.g., culture). The CCC-RS was not used because this method was developed primarily when a supervisor watched or listened to a therapist's sessions. Many scales on the CCC-RS require the rater to hear how a clinician speaks with the client (e.g., Socratic questioning, presenting conceptualization collaboratively). However, the CCC-RS contains one rating for multicultural considerations in conceptualizations that was modified for use in the present study.

The CFCCM also includes quality-based measures that were used in the present study. Case conceptualization quality was distributed across 3 different domains and an overall measure: precision of language, complexity, coherence, multiculturalism, and the overall quality measure. Precision of language was operationalized as the degree of individualization in the conceptualization and ranges on a 0 (*insufficient information*) to 4 (*high precision*) Likert-type scale. High precision scores indicated a high degree of individuality, and low precision scores indicated a nomothetic conceptualization. Complexity was operationalized as the degree of integration of multiple problems and areas into a conceptualization. Complexity was also rated on a 0 (*insufficient information*) to 4 (*high complexity*) Likert-type scale. Coherence was operationalized as the internal consistency of the conceptualization. Highly coherent conceptualizations could be summarized into a short and meaningful sentence. Coherence was also rated

on a 0 (*insufficient information*) to 4 (*high coherence*) Likert-type scale. Lastly, the overall quality measure was an overall rating on the quality of the conceptualization. Overall quality was also rated on a 0 to 4 Likert type scale. A score of 0 indicated *no presentation of a mechanism*. A score of 1 indicated *rudimentary presentation of a mechanism*, which was not linked to symptoms/problems, precipitating stressors, and/or more distant predisposing events. A score of 2 indicated a *presentation of a mechanism that was tied to either symptoms, precipitating stressors, or predisposing events*. A score of 3 indicated *adequate or strong mechanism tied to two of the following: symptoms, precipitating stressors, and more distant predisposing events*. A score of 4 indicated a *strong mechanism clearly linked to symptoms/problems, precipitating events, and predisposing events*.

Two primary modifications were made to the CFCCM for use in the present study. Many of the variables included in the CFCCM were not related to the hypotheses for the present study. First, conceptualizations were not separated into idea units. Idea units were not identified because there was no standardized vignette that all clinicians used for case formulation. The number of idea units in each category (e.g., descriptive information) varied by client, and may represent client characteristic differences rather than clinician ability differences. Second, treatment plan quality ratings were not scored. There was difficulty knowing whether or not the clinician performed what they wrote in the treatment plan, and measuring how student clinicians use conceptualizations was outside the goals of this study.

Instead of coding idea units, four primary content variables were coded in the conceptualization: Symptom and problem list, precipitating stressors, an inferred mechanism, and predisposing life events or the origin of mechanism. Each of these four categories was rated on a 3-point scale with anchors at 0 (*Not present*), 1 (*Somewhat present*), and 2 (*Clearly present*). The following operationalizations were extracted from existing publications (i.e., Eells et al., 2005; Kendjelic & Eells, 2007) and the CFCCM manual (Eells, Kendjelic, & Lucas, 1998). Symptom and problem list was operationalized as explicit indication of the client's current complaints. Precipitating stressors was operationalized as recent events or stressors that occurred in the individual's life that contributed to their current distress. Predisposing life events or origin of mechanism was operationalized as events that occurred in the past and contributed or exacerbated the hypothesized mechanism. Inferred mechanism was operationalized as a hypothesized causal reason for why the client was suffering from distress. In addition to the presence of an inferred mechanism, the type of mechanism was coded.

Mechanism reported in conceptualization. The CFCCM also codes the inferred mechanism into specific categories (e.g., cognitive, biological, behavioral). In addition to the standard categorical report, the specific mechanism was recorded verbatim (e.g., negative reinforcement). Mechanisms were identified by the usage of causal language in connection to the client's presenting problems or symptoms. If no mechanism was identifiable then the coder indicated the mechanism was *unable to code*. If multiple mechanisms were identified, then each mechanism was recorded. Mechanisms were coded into one of 10 categories: Cognitive, behavioral, affective, psychodynamic, skills

deficit, biological, sociocultural, symptoms, stressful events, and other. Other mechanisms were ill defined constructs that alluded to multiple categories of mechanisms. Examples of other mechanisms include: “discomfort with internal experiences,” “high expectations,” and “lack of enjoyment in life.”

Multicultural considerations in conceptualization. The original CFCCM did not include a specific code to identify whether the clinician took cultural considerations such as gender, race/ethnicity, sexual orientation, religion, or other demographic or identity factors into account when formulating the case. Given the importance of multicultural competency in clinical practice (American Psychological Association, 2003), an additional variable was coded: 0 – no evidence of consideration of cultural factors to 4 – cultural context was an explicit and well-integrated into conceptualization.

Therapist variables.

GRE. GRE scores were obtained from the permanent record of the clinical psychology graduate students that were formerly, or currently, enrolled at the UNL CPTP. All three primary GRE scores were obtained: Quantitative, Verbal, and Analytic. The GRE changed their scoring system in 2012. To compare GRE scores prior to 2012 and after 2012, all scores were converted into the new post-2012 format. This scoring conversion only occurred for the Quantitative and Verbal scores because the Analytic score was not affected by the new scoring system. Possible Quantitative and Verbal scores ranged from 130 to 170 in increments of 1 point. The standardized mean score for the Verbal section is 151, located at the 50th percentile. The standardized mean score for the Quantitative section is 152, located at the 48th percentile. Analytic writing

scores had a possible range of scores from 0 to 6, with higher scores reflecting better writing and critical thinking abilities. A GRE composite score was summed from the verbal and quantitative scores, and used for analyses. Analytic writing scores were examined separately from the GRE composite score.

Master's degree earned prior to CPTP. Prior educational experience of the therapists was obtained from the participants. The data were coded as: No master's degree, master's degree in clinical or counseling psychology, master's degree in other field, or doctorate in any field.

Previous clinical experience. Prior clinical experience of the therapists was obtained from participants. Previous clinical experience was rated on a 0 -1 scale. A score of 0 indicated that the individual had no clinical experiences prior to beginning the CPTP. A score of 1 was given if an individual worked with mentally ill people in summer camps, administered tests or assessments as part of a psychometrist position, or if the individual had prior experience providing therapy independently or under supervision of a psychologist (e.g., provisionally licensed mental health practitioner).

Admission date. Admission date was coded as the first day of the therapists first year in the UNL CPTP.

Grade level at time of report. Grade level was calculated by subtracting the therapists' admission date from the date of the report. This variable was reported as the number of days since admission, and was a proxy variable for experience.

Other variables.

Date of the report. The date of the report was coded from the assessment and treatment plan.

Supervising psychologist of report. The supervising psychologist of the report was coded from the signature line of the assessment and treatment plan.

Diagnosis. The Axis I or DSM 5 diagnosis, or diagnoses, of the case were recorded verbatim from the assessment and treatment plan.

Client demographics. Four client demographics were also collected from the clinical file: Age, ethnicity, gender, and sexual orientation.

Treatment completion. Treatment completion was operationalized as an indication of premature treatment dropout in the termination report. Treatment completion was indicated with *yes*, recommended treatment was completed, *no*, treatment was prematurely terminated by the client or other circumstances, *referred*, the client began receiving services elsewhere, or *unable to code* if it is unclear. For example, a premature treatment termination was indicated when a therapist sends a letter to the client to resume treatment and then closes the file without seeing the client since the letter was sent.

Number of sessions. The total number of sessions that a client was seen was also coded. This was indicated in the client file and was recorded as a quantitative variable.

Procedure

Participants were recruited through the UNL CTP. First, consent from the Director of Clinical Training and the Director of the Psychological Consultation Center trainee clinic was obtained to access records. Informed consent was also obtained from

the graduate student therapists. Participants were recruited via email. Email addresses for all students enrolled from 2009-2016 were obtained from the UNL CPTP. Potential participants were informed of the details of the study, and were provided a link to a survey to provide informed consent, basic demographic variables, and other therapist specific variables of interest (e.g., previous treatment experience prior to arriving at the UNL CPTP). A second reminder email was sent to potential participants two weeks after the initial invitation. There was no compensation for participants in this study. An undergraduate research assistant managed the therapist specific data, and assigned a participant ID to each therapist from a separate document. The participant ID was marked on each conceptualization. The therapist name was not in the same database as the FERPA data that was used for statistical purposes. The student specific data was stored in a locked room on a secured computer in the PI's research laboratory.

Once the consent process was completed, the PI examined each clinical file for each consenting therapist for an assessment and treatment plan. The principle investigator copied the case formulation and treatment plan, and replaced the assessment and treatment plan in the client's file. The PI redacted HIPAA (e.g., client name) and FERPA (e.g., therapist name) data with a black marker. The PI assigned the case conceptualization and treatment plans a new file number. The PI marked the paragraphs with a deidentified therapist ID number to compare the therapist's conceptualizations over time. Only the PI, secondary investigator, and two graduate research assistants were able to access the clinical records. The PI also examined the

clinical file to code and transfer variables of interest (e.g., number of sessions) into a secure, encrypted database to be used for statistical purposes.

The conceptualizations were coded using a modified version of the CFCCM described above. In addition to the principle investigator, two raters were trained to criterion with the CFCCM for coding case conceptualizations. These two raters were graduate students in the university of Nebraska-Lincoln clinical psychology training program. These two graduate students did not participate in this study, nor did they know the identities of the participants. The two graduate student coders and principle investigator examined the conceptualizations for the variables of interest. Additionally, coders read the entire assessment and treatment plan for descriptive information to fully understand the client's problems and better judge the accuracy of the conceptualization. Coders considered how the therapist wrote about presenting problems in their conceptualizations to inform the judgments of their quality ratings.

Coder training was completed on 12 training conceptualizations. The training conceptualizations were randomly selected from files eligible to be in the study. During this training phase, all three coders rated each conceptualization on the various presence and quality measures. Additionally, the coders identified the hypothesized mechanism that the therapist indicated. Consensus was achieved for any discrepancies that were not exact matches on any of the variables of interest. Once training was completed, each conceptualization was rated by at least two coders for all variables.

One hundred and thirteen files were coded for all variables of interest. Two of these files were excluded because the participant therapist provided no diagnosis, and

one was excluded for a nonclinically significant diagnosis (i.e., gender dysphoria¹). Two of these excluded files were training conceptualizations (one “no diagnosis” and one “gender dysphoria”). The other 110 conceptualizations were included in the following analyses.

Discrepancies of 2 points or more on any variable were resolved through discussion. There were a total of 77 discrepancies across 990 ratings over the 110 conceptualizations. Consensus was achieved after all discrepancy discussions. In the case of a 2 point discrepancy, the consensus rating replaced each individual’s ratings for that variable on that particular file for statistical analyses. The majority of these discrepancies ($n = 48$; 62%) occurred in the 5 quality ratings, with 29 (38%) discrepancies on the presence of precipitating stressors, mechanisms, and the origin of a mechanism. For the presence of content items, there were discrepancies on precipitating stressors ($n = 18$), origin of mechanism ($n = 6$), and hypothesized mechanism ($n = 5$). There were no 2-point discrepancies on the presence of symptoms. The 48 discrepancies in the quality measures were distributed across all 5 measures: coherence ($n = 15$), precision ($n = 15$), overall quality ($n = 7$), complexity ($n = 6$), and culture ($n = 5$).

Discrepancies on the hypothesized mechanism were not resolved through discussion unless there was a discrepancy of two points or more on the presence of a

¹ Only one of two cases of Gender Dysphoria was excluded. The one case that was excluded had no comorbidities, and denied any distress or functional impairment. This transgender individual was already expressing their gender in public and social contexts prior to intake. The diagnosis in this instance was provided so that the individual would be able to begin receiving hormone replacement therapy. The other case of gender dysphoria was coded and included in the following analyses.

mechanism. In the case of a disagreement in specific content or category of mechanism, the rating from the coder who had the most clinical experience was selected.

CHAPTER 3: RESULTS

Validity

Interrater reliability. To measure the interrater reliability between the coders, two-way mixed intraclass correlation coefficients (ICC) for absolute agreement were used. ICC was used instead of Cohen's kappa because three raters were present for the training cases and the data were ordinal, which violates an assumption of Cohen's kappa. Additionally, the clusters of quality scores between raters were viewed as more informative than the direction in which raters scored. Because consensus was achieved for every variable on the training conceptualizations (i.e., ICC = 1.0), the 10 training conceptualizations were excluded from the reliability analyses to remove artificial inflation. Overall, reliability ranged from moderate to excellent (Table 3.1; Koo & Li, 2016). The mean ICC between coders 1 and 2 was .90 and ranged from .78 to 1.0. The mean reliability between coders 1 and 3 was .85 and ranged from .69 to .96. The mean reliability between coders 2 and 3 was .89 and ranged from .78 to .99. ICC was unable to be performed for the presence of symptoms ratings because raters 1 and 3 indicated this variable was constant (i.e., all conceptualizations clearly wrote about symptoms). The second rater indicated that symptoms were partially present in two cases, and clearly present in all other conceptualizations.

Table 3.1

Intraclass Correlation Coefficients for Quality Variables

Raters	Complexity	Precision	Coherence	Culture	Overall Quality
1,2 ($n = 31$)	.781*	.920*	.854*	.966*	.868*
1,3 ($n = 34$)	.689*	.729*	.819*	.949*	.807*
2,3 ($n = 35$)	.832*	.836*	.776*	.887*	.912*

Note. Two-way fixed-effects model with absolute agreement, average measures. Training conceptualizations were excluded from reliability analyses. * $p < .001$

Rater validity. To test the assumption that the CFCCM appropriately assessed case formulation quality, scores on the CFCCM were compared to faculty rankings on four case conceptualizations. These four cases included a teenager with complicated bereavement (Case A), a woman with comorbid mood disorders (Case B), a woman with gender dysphoria and comorbid mood disorders (Case C), and a young adult with persistent depressive disorder (Case D). The three raters coded the case formulation sections using the modified CFCCM for all variables. The conceptualizations were then distributed to clinical psychology faculty. Twelve faculty members were approached and 10 participated in this portion of the study. The clinical faculty rank-ordered the conceptualizations from highest to lowest based on their perception of quality.

To determine if the coding manual agreed with faculty perceptions of quality case formulations, the four conceptualizations were coded by the 3 raters and rank-ordered by faculty members (Tables 3.2 and 3.3). The overall quality score coded by the 3 raters was averaged and rank ordered from best to worst. The 10 faculty rankings were also averaged. According to the coders using the manual, the quality rankings were (best to worst): B, C, A, and D. According to the faculty, the quality rankings were

(best to worst): C, B, A, and D. Conceptualizations C and B were ranked nearly equally among faculty members whereas the coders rated conceptualization B as 1.3 points higher than conceptualization C (see Table 3.3). It appears the coding system generally matches the faculty rankings of quality, with some discrepancy between the best and second best conceptualization.

Table 3.2
Conceptualization Quality by Rater

Quality Measure	Rater 1 <i>M (SD; n = 75)</i>	Rater 2 <i>M (SD; n = 76)</i>	Rater 3 <i>M (SD; n = 79)</i>	Average <i>M (SD; n = 110)</i>
Complexity	3.0 (.70)	3.1 (.88)	3.3 (.76)	3.2 (.72)
Precision	2.8 (.89)	2.8 (.99)	2.4 (.76)	2.7 (.85)
Coherence	2.6 (.84)	3.0 (.85)	2.6 (.76)	2.7 (.77)
Culture	0.5 (.83)	0.7 (1.1)	0.4 (.81)	0.5 (.90)
Overall Quality	2.5 (.74)	2.7 (.94)	2.6 (.89)	2.6 (.82)

Note. Training conceptualizations included in these descriptive statistics.

Table 3.3
Faculty Rankings Compared to Coding Manual Rankings for Case Conceptualization Quality

Case Example	Coding Manual Scoring for Overall Quality <i>M (SD)</i>	Coding Manual Ranking	Faculty Ranking (<i>M; SD</i>)
Case A (Grief)	2.33 (.58)	3	3 (3.0; .47)
Case B (Comorbid mood disorder)	4.00 (0)	1	2 (1.7; 1.06)
Case C (Gender Dysphoria/anxiety)	2.66 (.58)	2	1 (1.6; .52)
Case D (Dysthymia)	2.00 (1)	4	4 (3.7; .67)

Note. Coding manual scores ranged from 0 – 4. High scores indicate higher quality of conceptualization. Rankings range from 1-4, in which lower ranking indicates higher quality.

Discriminant validity. To verify the five aspects of conceptualization quality were different constructs, simple Pearson correlation coefficients were calculated (Table 3.4). Significant correlations ranged from small to large ($r = .20 - .56, p < .05$). All but two quality pairings (i.e., Complexity - Precision and Complexity - Coherence) were correlated with the other quality variables. Overall Quality was significantly correlated

with the other four quality measures. The relation between Overall Quality and Coherence was the strongest ($r = .56, p < .001$). Considering the strength of the correlations, the 5 quality measures were distinct constructs with some shared variance.

Table 3.4

Pearson Correlation Coefficients Comparing the Five Case Conceptualization Quality Measures

	Complexity	Precision	Coherence	Culture
Precision	.18±	-		
Coherence	.26**	.21*	-	
Culture	.12	.20*	.25**	-
Overall Quality	.33**	.28**	.56**	.25**

Note. ± $p < .06$. * $p < .05$. ** $p < .01$.

Hypothesis Testing

Hypothesis 1: Clinical psychology graduate therapists will improve the overall quality and complexity of their case conceptualizations over time after controlling for supervisor and previous clinical experience. A two-level hierarchical model examined the effects of time, supervisor of the conceptualization, and previous clinical experience on overall case conceptualization quality. It was expected that time would significantly predict quality of conceptualizations after controlling for prior clinical experience and supervisor.

First-level units were reports in which students wrote case conceptualizations. In total, 110 conceptualizations were collected. One supervisor (supervisor 9) was excluded from this analysis because only one conceptualization was written under their supervision and this created errors of singularity in the HLM program. As such, 109 conceptualizations were included in this analysis. Dummy coding was used to measure

differences between the remaining 8 supervisors. Second-level units were the 27 student therapists participating in the study. Prior clinical experience was added to the model as a second-level variable. Multilevel modeling was executed using HLM 7.02.

In the hypothesized model, the intercept was declared a random effect to reflect student variability in case conceptualization. Time and supervisory variables were declared fixed effects. The full model was executed as follows:

Level-1 Model.

$$Y_i (\text{Overall Quality}) = \pi_{0i} + \pi_{1i} * (\text{Months after start of 2nd year of graduate school}) \\ + \pi_{2i} * (\text{Supervisor 2}) + \pi_{3i} * (\text{Supervisor 3}) + \pi_{4i} * (\text{Supervisor 4}) + \pi_{5i} * (\text{Supervisor 5}) \\ + \pi_{6i} * (\text{Supervisor 6}) + \pi_{7i} * (\text{Supervisor 7}) + \pi_{8i} * (\text{Supervisor 8}) + e_{ti}$$

Level-2 Model.

$$\pi_{0i} = \beta_{00} + \beta_{01}(\text{Clinical experience prior to graduate school}) + r_{0i}$$

$$\pi_{1i} = \beta_{10} + \beta_{11}(\text{Clinical experience prior to graduate school})$$

$$\pi_{2i} = \beta_{20} + \beta_{21}(\text{Clinical experience prior to graduate school})$$

$$\pi_{3i} = \beta_{30} + \beta_{31}(\text{Clinical experience prior to graduate school})$$

$$\pi_{4i} = \beta_{40} + \beta_{41}(\text{Clinical experience prior to graduate school})$$

$$\pi_{5i} = \beta_{50} + \beta_{51}(\text{Clinical experience prior to graduate school})$$

$$\pi_{6i} = \beta_{60} + \beta_{61}(\text{Clinical experience prior to graduate school})$$

$$\pi_{7i} = \beta_{70} + \beta_{71}(\text{Clinical experience prior to graduate school})$$

$$\pi_{8i} = \beta_{80} + \beta_{81}(\text{Clinical experience prior to graduate school})$$

The overall model did not demonstrate overall case conceptualization quality improving with time after controlling for supervisor and clinical experience prior to

graduate school (Table 3.5). An interaction of supervisor and prior clinical experience demonstrated a significant increase in conceptualization quality by an average of 1.5 points if supervisor 2 (compared to supervisor 1) supervised any report and the student had no prior clinical experience. However, scores were an average of 1.5 points lower than supervisor 1 if supervisor 2 and prior clinical experience were both present. Additionally, the presence of supervisor 4 improved Overall Quality by 0.7 points compared to supervisor 1 for all therapists; prior experience did not interact with score differences for supervisors 1 and 4. No random effects were significant in the full model, including the effect of supervisor 2.

Table 3.5
Hierarchical Linear Model to Predict Overall Quality of Case Conceptualization

Predictor Variable	Coefficient	SE	t	df	p
Intercept	1.95	0.27	7.24	25	<.001
Time	-0.01	0.01	-0.64	66	0.522
Supervisor 2	1.53	0.34	4.54	66	<.001
Supervisor 3	1.10	0.80	1.38	66	0.173
Supervisor 4	0.69	0.33	2.13	66	0.037
Supervisor 5	0.87	0.72	1.21	66	0.230
Supervisor 6	0.58	0.39	1.49	66	0.140
Supervisor 7	-0.30	0.42	-0.72	66	0.473
Supervisor 8	0.40	0.60	0.68	66	0.500
Level 2 Fixed Effects					
Intercept*Prior experience	0.62	.38	1.62	25	0.12
Time*Prior experience	0.00	0.02	0.23	66	.816
Supervisor 2*Prior experience	-1.48	0.47	-3.15	66	0.002
Supervisor 3*Prior experience	-1.21	0.87	-1.38	66	0.172
Supervisor 4*Prior experience	-0.30	0.48	-0.62	66	0.532
Supervisor 5*Prior experience	-1.41	1.08	-1.31	66	0.195
Supervisor 6*Prior experience	-0.17	0.62	-0.28	66	0.778
Supervisor 7*Prior experience	-0.25	0.73	-0.35	66	0.731
Supervisor 8*Prior experience	-0.46	0.84	-0.54	66	0.588

Note. Time measured as months after the start of 2nd year.

To test for other supervisory effects, the full model was executed 7 more times with each variation changing the reference supervisor. Results indicated that students who were supervised by supervisor 2, compared to supervisor 4, scored about 0.8 points higher on conceptualization quality. However supervisor 4, compared to supervisor 2, scored 1.2 points higher if students had prior clinical experience. A similar pattern was present for comparing supervisors 2 and 6: supervisor 2's reports scored an average of 1 point higher on conceptualization quality. However, students with prior experience scored 1.4 points higher with supervisor 6 compared to supervisor 2. Supervisor 2 also performed an average of 1.8 points higher when compared to supervisor 7. Prior clinical experience did not interact between quality and supervisors 2 and 7. Conceptualization quality differences were trending on significance between supervisors 2 and 8 by an average of 1.1 points in favor of supervisor 2, $p < .06$. Prior experience did not interact with the relation between supervisors 2 and 7. Conceptualization quality differences also were present between supervisors 4 and 7, in which supervisor 4 performed 1 point higher. Prior experience did not interact with the quality difference between supervisor 4 and 7. A comparison of Overall Quality of conceptualizations supervised by supervisors 6 and 7 trended towards significance, in which supervisor 6 performed 0.9 points higher than supervisor 7, $p < .06$.

HLM was also conducted for each of the other four quality variables (i.e., complexity, precision, coherence, and culture; Tables 3.6-3.9). There were no main fixed effects, random effects, or interactions with prior clinical experience for any of these variables improving over time. However, random effects for the intercept of coherence,

and the random effects for slope of change of culture and precision were trending towards significant (all p 's < .07). Lastly, similar significant supervisory effects to the Overall Quality HLM model were exhibited in each of the other 4 quality variables.

Table 3.6
Hierarchical Linear Model to Predict Complexity of Case Conceptualization

Predictor Variable	Coefficient	SE	<i>t</i>	<i>df</i>	<i>p</i>
Intercept	2.99	0.24	12.17	25	<.001
Time	0.00	0.01	0.08	66	0.936
Supervisor 2	0.28	0.31	0.91	66	0.367
Supervisor 3	0.00	0.73	0.01	66	0.996
Supervisor 4	0.04	0.30	0.13	66	0.897
Supervisor 5	-1.28	0.65	-1.95	66	0.055
Supervisor 6	0.07	0.35	0.19	66	0.849
Supervisor 7	-0.09	0.39	-0.25	66	0.800
Supervisor 8	0.24	0.54	0.45	66	0.655
Level 2 Fixed Effects					
Intercept*Prior experience	0.51	0.35	1.47	25	0.154
Time*Prior experience	-0.01	0.02	-0.64	66	0.523
Supervisor 2*Prior experience	-0.64	0.43	-1.48	66	0.144
Supervisor 3*Prior experience	-0.39	0.80	-0.46	66	0.646
Supervisor 4*Prior experience	0.20	0.44	0.45	66	0.654
Supervisor 5*Prior experience	0.91	0.99	0.92	66	0.360
Supervisor 6*Prior experience	0.25	0.56	0.44	66	0.664
Supervisor 7*Prior experience	-0.35	0.66	-0.52	66	0.605
Supervisor 8*Prior experience	-1.43	0.77	-1.86	66	0.068

Note. Time measured as months after the start of 2nd year.

Table 3.7
Hierarchical Linear Model to Predict Precision of Case Conceptualization

Predictor Variable	Coefficient	SE	t	df	p
Intercept	2.17	0.31	7.06	25	<.001
Time	-0.00	0.01	-0.23	66	0.817
Supervisor 2	1.08	0.36	2.96	66	0.004
Supervisor 3	0.69	0.83	0.83	66	0.409
Supervisor 4	0.54	0.36	1.51	66	0.136
Supervisor 5	-0.56	0.78	-0.72	66	0.475
Supervisor 6	0.85	0.43	1.97	66	0.054
Supervisor 7	0.07	0.47	0.16	66	0.877
Supervisor 8	0.43	0.64	0.67	66	0.506
Level 2 Fixed Effects					
Intercept*Prior experience	0.61	0.43	1.44	25	0.16
Time*Prior experience	-0.14	0.02	-0.76	66	0.449
Supervisor 2*Prior experience	-0.68	0.50	-1.35	66	0.180
Supervisor 3*Prior experience	-0.94	0.92	-1.03	66	0.309
Supervisor 4*Prior experience	-0.74	0.52	-1.42	66	0.161
Supervisor 5*Prior experience	1.26	1.15	1.10	66	0.275
Supervisor 6*Prior experience	-0.38	0.67	-0.56	66	0.576
Supervisor 7*Prior experience	-.71	0.81	-0.86	66	0.389
Supervisor 8*Prior experience	-0.41	0.90	-0.46	66	0.650

Note. Time measured as months after the start of 2nd year.

Table 3.8
Hierarchical Linear Model to Predict Coherence of Case Conceptualization

Predictor Variable	Coefficient	SE	t	df	p
Intercept	2.65	0.26	10.31	25	<.001
Time	-0.00	0.01	-0.47	66	0.638
Supervisor 2	0.43	0.32	1.34	66	0.185
Supervisor 3	0.38	0.76	0.50	66	0.621
Supervisor 4	-0.16	0.31	-0.52	66	0.602
Supervisor 5	1.32	0.68	1.93	66	0.058
Supervisor 6	0.49	0.37	1.32	66	0.192
Supervisor 7	-0.42	0.40	-1.04	66	0.300
Supervisor 8	-0.58	0.57	-1.02	66	0.313
Level 2 Fixed Effects					
Intercept*Prior experience	-0.01	0.36	-0.03	25	0.980
Time*Prior experience	0.03	0.02	2.05	66	0.045
Supervisor 2*Prior experience	-0.66	0.45	-1.48	66	0.145
Supervisor 3*Prior experience	-0.73	0.84	-0.87	66	0.385
Supervisor 4*Prior experience	0.50	0.46	1.089	66	0.280
Supervisor 5*Prior experience	-2.39	10.3	-2.32	66	0.024
Supervisor 6*Prior experience	-1.40	0.59	-2.38	66	0.020
Supervisor 7*Prior experience	-0.91	0.70	-1.32	66	0.193
Supervisor 8*Prior experience	-0.29	0.80	-0.36	66	0.717

Note. Time measured as months after the start of 2nd year.

Table 3.9
Hierarchical Linear Model to Predict Cultural Quality of Case Conceptualization

Predictor Variable	Coefficient	SE	t	df	p
Intercept	0.36	0.33	1.07	25	0.294
Time	-0.01	0.01	-0.67	66	0.505
Supervisor 2	0.66	0.42	1.57	66	0.121
Supervisor 3	0.70	0.99	0.71	66	0.482
Supervisor 4	0.26	0.40	0.65	66	0.521
Supervisor 5	0.05	0.89	0.06	66	0.956
Supervisor 6	0.55	0.58	1.16	66	0.251
Supervisor 7	-0.00	0.52	-0.01	66	0.993
Supervisor 8	-0.22	0.74	-0.30	66	0.767
Level 2 Fixed Effects					
Intercept*Prior experience	0.07	0.47	0.15	25	0.879
Time*Prior experience	0.04	0.02	1.67	66	0.100
Supervisor 2*Prior experience	-1.00	0.58	-1.72	66	0.090
Supervisor 3*Prior experience	-0.83	1.08	-0.76	66	0.449
Supervisor 4*Prior experience	-0.64	0.60	-1.07	66	0.288
Supervisor 5*Prior experience	-0.89	1.34	-0.67	66	0.506
Supervisor 6*Prior experience	-0.87	0.76	-1.13	66	0.260
Supervisor 7*Prior experience	-0.61	0.90	-0.67	66	0.503
Supervisor 8*Prior experience	-0.18	1.04	-0.17	66	0.864

Note. Time measured as months after the start of 2nd year.

To examine if the degrees of freedom washed out any significant effects of time, a simple correlation between each of the five quality variables and time was conducted. Time was not related to Complexity ($r = -.10$), Precision ($r = -.03$), Culture ($r = .05$), or Overall Quality ($r = .09$), all p 's $> .10$. However, there was a trend in which Coherence ($r = .18$) improved over time, $p = .067$.

Hypothesis 2: Higher quality of conceptualization will be associated with higher GRE scores after controlling for supervisor. To examine the second hypothesis, Pearson correlations initially examined the relation between the quantitative-verbal GRE mean score, GRE analytic writing score, and Overall Quality of conceptualizations. The average of the GRE quantitative and verbal scores was not related to overall quality of case

conceptualization across all reports, $r = .14$, $p = .15$. Similarly, the GRE analytical writing score was not associated with higher quality conceptualizations, $r = .05$, $p = .63$.

Pearson correlations were then conducted to examine the GRE scores for each of the first three conceptualizations written by students. For the first report, the GRE Verbal score was positively associated with Coherence, $r = .41$, $p < .05$. For the second report, there were no significant correlations between GRE scores and any of the quality variables; however, trends emerged in the analysis. GRE Verbal negatively trended with complexity, $r = -.37$, $p = .058$. GRE Quantitative negatively trended with coherence, $r = -.38$, $p = .053$. GRE Verbal-quantitative sum negatively trended with coherence, $r = -.37$, $p = .059$. GRE analytic negatively trended with complexity, $r = -.36$, $p = .066$. For the third report, GRE quantitative was negatively correlated with complexity, $r = -.42$, $p < .05$. For the third report, GRE Verbal displayed a positive trend with greater cultural quality, $r = .37$, $p = .068$.

In the full regression model, quantitative-verbal average and the analytic writing score were entered with 9 supervisors to predict case conceptualization quality. Eight dummy-coded supervisor variables were created, and one senior supervisor served as the reference group. The full regression model was statistically significant and predicted variance in overall quality of case conceptualization, $R^2 = .20$, $F(10, 99) = 2.43$, $p < .05$. However, the quantitative-verbal sum ($\beta = .14$, $p = .17$) and analytic score ($\beta = .02$, $p = .89$) were not significant after controlling for supervisor. This regression model was also conducted three additional times, with each iteration including either report 1, 2, or 3.

In each of these analyses, neither quantitative-verbal sum nor the analytic score were statistically significant, all p 's > .05.

This full regression model was also conducted for the other 4 quality variables within reports 1, 2, and 3. Culture on report 2 was the only quality variable that demonstrated a statistically significant regression model, $R^2 = .70$, $F(9, 17) = 4.29$, $p < .01$. However, neither of the GRE scores were statistically significant predictors of cultural quality in the report. Only the presence of one supervisor predicted an increase in cultural quality for report 2.

Hypothesis 3: Lower conceptualization quality will be associated with greater likelihood of premature treatment termination. To examine the third hypothesis, a one-way ANOVA was conducted to examine the relation between overall quality of case conceptualization and treatment completion across all reports. There was no statistically significant relation between treatment completers ($n = 42$) and treatment dropouts ($n = 44$), $F(4, 105) = 1.81$, $p = .13$. Analyses also looked at this relation within reports 1, 2, and 3 (Table 3.10). There were no statistical differences within reports 1, 2, or 3 for treatment completers and premature treatment dropouts for any of the 5 quality variables. However, the conceptualizations of clients that were referred during the 1st report demonstrated 1.19 points lower on overall quality compared to clients who completed treatment, $F(2, 23) = 3.52$, $p < .05$. This analysis was also conducted for reports written during the entirety of 2nd year, in which no statistical differences were found between any of the 5 quality variables and treatment completion.

Table 3.10
Quality Scores Compared by Treatment Completion Across Reports

	Report 1			Report 2			Report 3			Average of Reports		
	TC <i>M (SD)</i> (<i>n</i> = 13)	PD <i>M (SD)</i> (<i>n</i> = 10)	R <i>M (SD)</i> (<i>n</i> = 3)	TC <i>M (SD)</i> (<i>n</i> = 13)	PD <i>M (SD)</i> (<i>n</i> = 9)	R <i>M (SD)</i> (<i>n</i> = 4)	TC <i>M (SD)</i> (<i>n</i> = 6)	PD <i>M (SD)</i> (<i>n</i> = 13)	R <i>M (SD)</i> (<i>n</i> = 3)	TC <i>M (SD)</i> (<i>n</i> = 42)	PD <i>M (SD)</i> (<i>n</i> = 44)	R <i>M (SD)</i> (<i>n</i> = 16)
Complexity	3.23 (.69)	3.60 (.66)	2.83 (.58)	3.08 (.95)	3.11 (.74)	3.25 (.65)	3.17 (.68)	2.92 (.73)	2.67 (1.04)	3.15 (.74)	3.22 (.73)	3.0 (.68)
Precision	2.46 (.90)	2.75 (.75)	1.83 (1.44)	2.35 (.85)	2.67 (.71)	3.13 (.48)	3.17 (.52)	2.88 (.87)	1.83 (.76)	2.65 (.88)	2.77 (.81)	2.53 (.92)
Coherence	3.04 (.66)	2.55 (.80)	2.17 (1.53)	2.54 (.97)	2.44 (.53)	2.88 (.63)	2.75 (.76)	2.65 (.72)	2.0 (1.0)	2.80 (.80)	2.67 (.73)	2.38 (.83)
Cultural	.81 (1.20)	.65 (.91)	0 (0)	.27 (.48)	.17 (.35)	.88 (1.44)	0 (0)	.54 (1.11)	0 (0)	.50 (.86)	.61 (1.02)	.34 (.79)
Overall	2.69	2.60	1.50	2.19	2.78	2.75	2.58	2.69	2.0	2.62	2.66	2.19
Quality	(.80)	(.52)	(.87)	(1.05)	(.67)	(.65)	(.49)	(.80)	(.50)	(.86)	(.71)	(1.00)

Note. TC = Treatment Completed. PD = Premature Dropout. R = Referred. Individuals who were still enrolled in treatment at the time of data collection (*n* = 8) were not included in these comparisons.

Exploratory Analyses

Question 1: What mechanisms do UNL CPTP students tend to use in their conceptualizations? Clinicians hypothesized an average of 2.18 ($SD = 1.31$) mechanisms per report (Range from 0 – 8) for a total of 240 mechanisms across all 110 reports. Almost all categories of mechanisms were hypothesized by clinicians, except no clinician hypothesized a psychodynamic construct. The average number and type of mechanisms varied per academic year and report number (Tables 3.11 and 3.12). The categories of hypothesized mechanism were symptoms ($n = 70$; 29.2%), other ($n = 61$; 25.4%), cognitive ($n = 34$; 14.2%), behavioral ($n = 21$; 8.7%), stressful events ($n = 16$; 6.67%), sociocultural ($n = 14$; 5.8%), biological ($n = 9$; 3.7%), affective ($n = 8$, 3.33%), and skills deficits ($n = 7$; 2.9%).

Table 3.11
Number of Mechanisms Hypothesized per Conceptualization by Therapist's Academic Year

Year in Program	COG <i>M</i> (<i>SD</i>)	BEH <i>M</i> (<i>SD</i>)	AFF <i>M</i> (<i>SD</i>)	SkD <i>M</i> (<i>SD</i>)	BIO <i>M</i> (<i>SD</i>)	SOC <i>M</i> (<i>SD</i>)	SYM <i>M</i> (<i>SD</i>)	STR <i>M</i> (<i>SD</i>)	OTH <i>M</i> (<i>SD</i>)
1st-2nd Year ($n = 73$)	.27 (.53)	.12 (.41)	.11 (.36)	.08 (.28)	.05 (.23)	.15 (.46)	.75 (1.05)	.12 (.37)	.58 (.62)
3rd Year ($n = 20$)	.50 (.51)	.15 (.37)	0	0	.10 (.31)	.10 (.31)	.50 (.83)	.30 (.47)	.60 (.82)
4th+ Year ($n = 17$)	.24 (.56)	.53 (.72)	0	.06 (.24)	.18 (.39)	.06 (.24)	.29 (.59)	.06 (.24)	.41 (.71)

Note. No psychodynamic mechanisms were hypothesized. COG = Cognitive. BEH = Behavioral. AFF = Affective. SkD = Skills Deficit. BIO = Biological. SOC = Sociocultural. SYM = Symptoms. STR = Stressful Events. OTH = Other.

Table 3.12

Number of Mechanisms Hypothesized per Conceptualization by Therapist's Report Number

Report Number	COG <i>M</i> (<i>SD</i>)	BEH <i>M</i> (<i>SD</i>)	AFF <i>M</i> (<i>SD</i>)	SkD <i>M</i> (<i>SD</i>)	BIO <i>M</i> (<i>SD</i>)	SOC <i>M</i> (<i>SD</i>)	SYM <i>M</i> (<i>SD</i>)	STR <i>M</i> (<i>SD</i>)	OTH <i>M</i> (<i>SD</i>)
1st Report (<i>n</i> = 27)	.26 (.53)	.11 (.32)	0	0	.04 (.19)	.15 (.46)	1.07 (1.3)	.07 (.27)	.44 (.51)
2nd Report (<i>n</i> = 27)	.33 (.56)	.19 (.56)	.15 (.46)	.11 (.32)	.04 (.19)	.19 (.48)	.70 (1.03)	.04 (.19)	.56 (.58)
3rd Report (<i>n</i> = 25)	.36 (.57)	.08 (.28)	.12 (.33)	.12 (.33)	.12 (.33)	.08 (.40)	.48 (.77)	.32 (.56)	.60 (.82)
4th Report (<i>n</i> = 17)	.35 (.61)	.35 (.61)	.06 (.24)	.06 (.24)	.12 (.30)	0	.24 (.44)	.12 (.33)	.76 (.75)
5th Report (<i>n</i> = 12)	.17 (.39)	.33 (.65)	0	0	.08 (.29)	.25 (.45)	.42 (.67)	.25 (.45)	.42 (.79)
6th Report (<i>n</i> = 2)	.50 (.71)	.50 (.71)	0	0	.50 (.71)	0	.50 (.71)	0	.50 (.71)

Note. No psychodynamic mechanisms were hypothesized. COG = Cognitive. BEH = Behavioral. AFF = Affective. SkD = Skills Deficit. BIO = Biological. SOC = Sociocultural. SYM = Symptoms. STR = Stressful Events. OTH = Other.

A one-way ANOVA demonstrated a statistical difference in the number of behavioral mechanisms hypothesized per academic year, $F(2, 107) = 5.46, p = .006$. Tukey's posthoc analyses demonstrated that individuals with four or more years of clinical experience tend to utilize more behavioral mechanisms ($M = .53; SD = .72$) than the aggregate of 1st and 2nd years ($M = .12; SD = .41; p = .004$) and third years ($M = .15; SD = .37, p = .037$). There were no statistical differences between academic years for hypothesized cognitive, affective, skills deficits, biological, sociocultural, symptom, stressful events, or other mechanisms, all $p's > .10$.

Additionally, a one-way ANOVA was conducted to compare hypothesized mechanisms across report order. There were no statistical differences between report order for any hypothesized mechanism. However, there was a statistical trend within

reports for the number of hypothesized casual symptoms $F(5,104) = 2.09, p = .073$, and stressful events, $F(5,104) = 2.05, p = .078$. . Tukey's post-hoc analyses revealed *symptoms* on first and fourth reports trended towards significance in which first reports tended to include .84 more symptoms as causal mechanisms per report, $p = .054$. Additionally, second reports, compared to third reports, trended towards significance to include .28 fewer *stressful events* per report as causal mechanisms, $p = .07$.

Question 2: What is the average quality of the conceptualizations per year in the program? To explore the quality of conceptualizations by year in the program and by report number, simple descriptive statistics were collected (Tables 3.13 and 3.14). Across all years, the average complexity score was 3.15 ($SD = .72$), the average precision score was 2.68 ($SD = .85$), the average coherence score was 2.7 ($SD = .77$), the average multicultural score was .52 ($SD = .91$), and the average overall quality score was 2.6 ($SD = .82$). A one-way ANOVA compared year in program to each of the five conceptualization quality variables. There were no statistical differences across year in program and any of the conceptualization quality measurements, all p 's $> .10$.

Table 3.13
Average Quality Ratings by Year in Program

Year in Program	Complexity <i>M (SD)</i>	Precision <i>M (SD)</i>	Coherence <i>M (SD)</i>	Culture <i>M (SD)</i>	Overall Quality <i>M (SD)</i>
1st-2nd Year (<i>n</i> = 73)	3.21 (.73)	2.68 (.89)	2.62 (.81)	0.49 (.90)	2.56 (.83)
3rd Year (<i>n</i> = 20)	2.95 (.69)	2.70 (.77)	2.78 (.70)	0.38 (.89)	2.65 (.67)
4th+ Year (<i>n</i> = 17)	3.15 (.68)	2.65 (.79)	3.03 (.65)	0.79 (.94)	2.62 (.99)

Note. Academic years were combined due to small sample size identifying participants.

Table 3.14
Average Quality Ratings by Report

Report Number	Time <i>M (SD)</i>	Complexity <i>M (SD)</i>	Precision <i>M (SD)</i>	Coherence <i>M (SD)</i>	Culture <i>M (SD)</i>	Overall Quality <i>M (SD)</i>
1st Report (<i>n</i> = 27)	4.01 (3.5)	3.31 (.68)	2.56 (.94)	2.76 (.84)	.63 (1.01)	2.56 (.79)
2nd Report (<i>n</i> = 27)	8.1 (5.4)	3.11 (.80)	2.59 (.77)	2.57 (.77)	.35 (.68)	2.50 (.89)
3rd Report (<i>n</i> = 25)	12.4 (5.7)	3.00 (.70)	2.80 (.80)	2.62 (.75)	.38 (.89)	2.56 (.68)
4th Report (<i>n</i> = 17)	19.01 (11.91)	3.26 (.66)	2.88 (.78)	2.82 (.75)	.76 (1.15)	2.71 (.77)
5th Report (<i>n</i> = 12)	27.27 (12.77)	3.13 (.68)	2.62 (.98)	2.83 (.75)	.67 (.81)	2.67 (1.17)
6th Report (<i>n</i> = 2)	66.08 (12.2)	2.75 (1.06)	2.5 (1.41)	3.25 (1.06)	0 (0)	3.00 (.71)

Note. Time was defined as the number of months after the start of 2nd year.

Additionally, a one-way ANOVA was conducted to examine if any of the conceptualization quality variables improved with increased report experience. There were no statistically significant differences between report number and any conceptualization quality variable, all p 's > .10.

Question 3: What predicts initial case conceptualization ability? To examine the third exploratory question that verbal, quantitative, and analytic GRE scores and a prior master's degree would predict Overall Quality on the first conceptualization, a multiple regression was conducted (Table 3.15). None of the variables were significantly correlated with Overall Quality of the first conceptualization. Further, the overall multiple regression model was not statistically significant, and none of the variables predicted Overall Quality, $R^2 = .08$, $F(4, 22) = .47$, $p = .76$. Follow-up correlations were

conducted (Table 3.16). Analyses were also conducted for the four other quality variables. The only statistically significant effect was the relation between GRE quantitative scores and Coherence on the first case conceptualization written, in which greater quantitative scores tended to relate with better Coherence scores, $r = .41$. GRE quantitative scores were also significantly related to coherence scores after controlling for other GRE scores and a prior master's degree. However, the full regression model did not reliably predict Coherence scores on the first conceptualization, $R^2 = .21$, $F(4, 22) = 1.44$, $p = .25$.

Table 3.15
Predicting Each Quality Variable of the First Conceptualization

	<i>B</i>	β	<i>t</i>	<i>P</i>	<i>R</i> ²	<i>F</i>	<i>df</i>	<i>p</i>
Overall Quality					.078	.465	4,22	.761
Constant	-3.746		-.744	.465				
GRE_Analytical	0.93	.08	.346	.733				
GRE_Verbal	.019	.138	.589	.562				
GRE_Quant	.018	.016	.728	.474				
Master's Degree	.034	.017	.08	.937				
Complexity					.244	1.778	4,22	.169
Constant	-.566		-.144	.887				
GRE_Analytical	-.402	-.400	-1.909	.069				
GRE_Verbal	.02	.169	.796	.435				
GRE_Quant	.018	.182	.912	.372				
Master's Degree	-.621	-.361	-1.855	.077				
Precision					.166	1.098	4,22	.382
Constant	-4.543		-.793	.436				
GRE_Analytical	.366	.262	1.192	.246				
GRE_Verbal	-.012	-.076	-.340	.737				
GRE_Quant	.045	.325	1.554	.134				
Master's Degree	.213	.089	.438	.666				
Coherence					.208	1.441	4,22	.254
Constant	-5.239		-1.058	.301				
GRE_Analytical	-.162	-.131	-.612	.547				
GRE_Verbal	-.001	-.010	-.045	.964				
GRE_Quant	.056	.458	2.244	.035				
Master's Degree	.263	.125	.626	.538				
Cultural					.056	.323	4,22	.859
Constant	-2.092		-.319	.753				
GRE_Analytical	-.09	-.06	-.258	.799				
GRE_Verbal	.04	.229	.964	.346				
GRE_Quant	-.018	-.123	-.554	.585				
Master's Degree	-.354	-.138	-.636	.532				

Note. GRE scores prior to 2012 were converted to the new scoring system. *n* = 27.

Table 3.16
Correlation of Quality Variables and Exploratory Predictors of Initial Case Conceptualization Ability

	Complexity	Precision	Coherence	Cultural	Overall Quality
GRE_Analytical	-.208	.269	-.082	.043	.160
GRE_Verbal	.082	.134	.086	.168	.223
GRE_Quant	.224	.333	.409*	-.036	.218
Master's Degree	-.296	-.029	.082	-.110	-.034

Note. * $p < .05$, $n = 27$

CHAPTER 4: DISCUSSION

The present study examined the development of case conceptualization ability throughout clinical psychology graduate training. Twenty-seven student therapists wrote 110 conceptualizations during their graduate training, and each conceptualization was coded for five primary quality variables. Conceptualization quality was measured with a modified version of the CFCCM. In summation, none of the hypotheses were supported by the results of this study likely due to the greater than expected supervisory effects. Reasons for these results and implications are discussed below.

Validity

To examine the validity of the CFCCM, four conceptualizations were coded by three coders for each of the 5 quality variables. These four conceptualizations were also rank ordered by overall quality from 10 faculty members. The CFCCM and faculty rankings disagreed on which conceptualization was the best; however, both agreed on the order of worst and second worst conceptualization (Table 3.2). When the average faculty rankings and the average overall quality scores of the CFCCM were examined, the average faculty ranking of the top two conceptualizations was nearly identical whereas the coding system suggested about a 1-point (i.e., 28%) difference in Overall Quality. The scores indicated that slightly more faculty preferred conceptualizations with explicit cultural considerations than complex and coherent conceptualizations. When examining the rankings of the other CFCCM conceptualization scores, the rank order of cultural quality is identical to the rank order of faculty for overall quality. Considering the importance of diversity in psychological practice, clinical psychology faculty may weight cultural considerations with more importance than the CFCCM when

measuring overall quality of conceptualizations. This emphasis in multicultural psychology may result in a slightly greater preference for cultural considerations over than other quality variables such as complexity and coherence. However, these differences were small. As such, it appeared that the coding manual was valid for measuring conceptualization quality.

Hypothesis 1: Clinical psychology graduate therapists will improve the overall quality of their case conceptualizations over time after controlling for supervisor and previous clinical experience.

Hypothesis 1 was not supported. Pearson correlations indicated that time was not related to any of the five quality variables, and remained unrelated after controlling for supervisory effects and any previous clinical experiences students may have acquired prior to graduate training.

It was unclear why time was unrelated to the five conceptualization quality variables. One potential explanation for the null result could be the process by which conceptualizations were developed. In order for reports to be finalized in the client's file and subsequently coded, the supervisor was expected to have read and approved of the entire report, including the conceptualization. It is possible, and likely in many cases, that supervisors edited reports to align with their clinical expertise rather than solely representing the conceptualization of the student therapist. In support of this perspective, the only significant effects in the Hypothesis 1 models were supervisory effects. Certain supervisors tended to supervise reports with higher conceptualization scores. Some supervisors may have higher expectations for conceptualizations and

clinical reports and may have provided more significant edits to clinical reports than other supervisors. However, the interpretation of the supervisory effects is limited because supervisors were not randomized to reports. Some supervisors tended to supervise certain reports due to the timing of the semester. For example, Supervisor Y may teach the clinical intervention course every fall semester, which is when the majority of the first reports were written. Supervisor Y may have few, if any, reports beyond the second conceptualization. As such, it is difficult to isolate the supervisory effects solely to supervisor.

Interestingly, the supervisory effects were sometimes moderated by student clinical experience. A student supervised by Supervisor 2 scored much higher on overall quality than if they were supervised by Supervisor 1 when the students had no prior clinical experience, but reports by Supervisor 1 were much higher than Supervisor 2 on overall quality if there was no prior clinical experience for the student. It may be that certain supervisors examined conceptualizations with different scrutiny dependent on student variables (e.g., clinical experience), or adapted their supervisory style to address other clinical competencies.

The presence of supervisor predicted changes in conceptualization scores rather than student-specific variables. Further, subsequent conceptualizations did not display a permanent boost to their conceptualization ability. This indicated that higher quality conceptualizations were more dependent upon the supervisor rather than the therapist. Considering the research on supervision, this effect was unsurprising. Eells and Lombart (2003) noted that novice therapists tended to develop conceptualizations more similarly

to expert clinicians rather than early-career psychologists, and this may relate to the intensive evaluation required by clinical psychology training programs and supervising psychologists. The differences between supervisors may indicate that certain clinical competencies (e.g., case formulation) are emphasized over others. For example, some supervisors may focus supervision towards learning the non-specific factors of psychotherapy (e.g., empathic reflections) for students treating their first clients rather than the cognitively complex task of conceptualization. The variable supervisory effects may indicate that supervisors identify growth areas for students, and focus their supervisory efforts towards developing those competencies. Although time was not related to case conceptualization ability in this study, these results may demonstrate that clinical supervisors are performing their functions as both trainers and gatekeepers to the profession of clinical psychology and ensuring that only conceptualizations of sufficient quality are included in the clinical record.

Hypothesis 2: Higher quality of conceptualization will be associated with higher GRE scores after controlling for supervisor.

Hypothesis 2 was not supported. None of the GRE scores were related to any of the quality variables across all of the reports after controlling for supervisory effects in the regression models. The regression analysis was also conducted three additional times to examine the relation between GRE scores and quality for the first, second, and third conceptualization. Only one regression model was statistically significant: cultural quality on report 2. Although GRE scores did not predict cultural quality, the presence of

a specific supervisor compared to the reference supervisor predicted higher cultural quality.

Follow-up analyses examined simple correlations between GRE scores and the five quality variables on each of the first three reports. Few effects were statistically significant, but many trends emerged for complexity, coherence, and culture. Interestingly, some results were inconsistent between reports. For example, GRE Quantitative was positively related with Coherence with a moderate effect on the first report, but negatively trended with Coherence on the second report. Another variable relation emerged: Complexity scores were negatively associated with GRE Quantitative scores on the third report, and negatively trended with GRE Verbal and GRE Analytic on the second report. It seems that complexity may be inversely related to GRE scores; however, the small sample size of therapists likely contributed to null and inconsistent effects. This may indicate that GRE scores are more important for the first conceptualization that a student develops, and this effect diminishes as students learn more about psychopathology and the provision of psychotherapy. However, meta-analyses found that verbal and quantitative GRE scores predict both first year and overall Grade Point Average (Kuncel, Hezlett, & Ones, 2001; Kuncel, Wee, Serafin, & Hezlett, 2010). It is possible that supervisory effects masked the relation between GRE scores and the quality variables. Similar to hypothesis 1, this may demonstrate that supervisors emphasize different intervention competencies during clinical training.

The addition of a prior master's degree to the model did not improve the model's prediction capability of case conceptualization, nor did master's degree alone

predict any of the conceptualization quality variables. Although a prior master's degree demonstrates prior success in graduate school, the quality of master's programs is variable and may not indicate a student was more adept in psychological theory than students who were selected to attend graduate school immediately upon conferral of an undergraduate degree.

Hypothesis 3: Lower conceptualization quality will be associated with greater likelihood of premature treatment termination.

Hypothesis 3 was not supported. There was no difference in treatment dropout related to any of the five conceptualization quality variables across any of the reports. Only one significant effect emerged, in which therapists who referred their clients to a new therapist tended to have lower quality conceptualizations than clients who completed treatment.

Case conceptualizations should guide treatment decision making (Persons & Talbot, 2015). It is reasonable to suggest that conceptualizations that ineffectively guide treatment plans would be more likely to have a client to prematurely terminate treatment. In the present study, it appeared that treatment dropout may not be robustly associated with the quality of conceptualizations. Clients discontinue therapeutic services prematurely for various reasons, including time constraints and transportation difficulties, among others (Mohr et al., 2010). However, clients who intended to remain in treatment and were poorly conceptualized may have continued with therapy services longer, which may have required a referral to a new therapist after stagnant treatment progress. Given the limitations of research in the field of

conceptualization and design limitations of the present study, this is speculation at best. Case conceptualization may improve treatment outcomes for individuals who continue with psychotherapy; however, it does not appear associated with improving treatment retention for individuals considering discontinuing psychotherapeutic services.

Question 1: What mechanisms do UNL CPTP students tend to use in their conceptualizations?

Across all reports, various categories of mechanisms were hypothesized. When comparing the academic year of the clinician to the types of causal mechanisms hypothesized, an effect emerged in which therapists with 4 or more years of graduate training hypothesized more behavioral mechanisms compared to students with 1-3 years of graduate training. Considering the sample was collected from a training program with an emphasis in the cognitive-behavioral theoretical orientation, it was unsurprising that behavioral mechanisms were utilized more frequently. Similarly, a trend emerged in which the first report written by students, regardless of academic year, included more symptoms as causal mechanisms compared to the fourth report. Hypothesizing symptoms as causal mechanisms is believed to be a marker of lower-level case conceptualization, in which higher quality conceptualizations may hypothesize at the case-level (Persons & Tompkins, 2007). It appears that as students gain clinical experience, they improve the clinical utility of their conceptualizations.

Question 2: What is the average quality of the conceptualizations per year in the program?

The averages of the five quality variables ranged from poor (cultural) to good (complexity), with no differences emerging across training year or order of the reports. Compared to the other quality variables, cultural quality was much lower, which indicated that students rarely noted cultural considerations in case conceptualization. Incorporating diversity into conceptualizations may be a relative weakness for students. However, the majority of clients were white, cisgender, and heterosexual. Students may not have written about cultural factors unless the individual were of a visible minority group rather than other cultural factors (e.g., rurality, spirituality, socioeconomic status). Diversity is an integral component of training in clinical psychology and the provision of psychotherapy (American Psychological Association Commission on Accreditation, 2015). Patient values, including cultural identities, are a critical component of evidence-based practice (Sackett, Straus, Richardson, Rosenberg, & Haynes, 2000). It appears that the inclusion of explicit cultural considerations may be a significant weakness in of the many reports examined. The low scores do not appear to relate to how culture quality was measured as the entire range of quality scores was collected from the present sample, and the anchors in the coding manual were comparable to the other quality variables. Integrating diversity into case conceptualizations may be a more difficult skill for student clinicians to learn, particularly when diverse cultural factors are covert (Lee & Tracey, 2008).

The quality scores were moderately higher compared to another study that utilized the CFCCM with conceptualizations developed by students for real-world clients upon intake (Kendjelic & Eells, 2007). Scores may be higher in the present study because

conceptualizations were written typically after three sessions of contact with the client, which provided the student more assessment opportunities prior to conceptualization. When the quality scores were compared to conceptualizations developed for standardized vignettes, the present sample's quality scores were moderately greater in complexity and coherence, but slightly lower in overall quality (Eells, Lombart, Kendjelic, Turner, & Lucas, 2005). Cultural quality scores of the current study were unable to be compared to other studies because the original CFCCM did not reference the cultural quality.

Considering the results of this study, the novice therapist tends to write a fair-quality, symptom-level conceptualization that emphasizes symptoms and presenting problems as causal mechanisms for psychological disorders. As students advance in their clinical training, they tend to incorporate more behavioral mechanisms and more frequently develop disorder- or case-level conceptualizations, which enhances the clinical utility of the conceptualization. For example, a student early in training may hypothesize that depression is causing marital difficulties (symptom-level conceptualization), and a student with more advanced training may hypothesize that the negative reinforcement of emotionally avoidant behaviors (e.g., ignoring spouse, lying in bed excessively) leads to both the depressive symptoms and marital conflict (disorder-level conceptualization). Although the sophistication of conceptualizations tends to improve, students throughout their training sparsely mention cultural factors, and typically only discuss diversity when it is the focus of treatment (e.g., working with gender minorities). Similarly, the overall written quality of conceptualizations remains

unchanged throughout training, and supervision critically impacts how students conceptualize their clients.

Limitations

The first limitation of the study was the retrospective design of the study that allowed for all of the reports to be edited by clinical supervisors. It was impossible to isolate the quality of a conceptualization to therapist ability alone. Supervisors have slightly different expectations for a conceptualization (see validity section), a variety of case formulation methods exist (Bucci, French, & Berry, 2016), and the final conceptualization was likely a collaboration of both supervisor and supervisee. Considering themes emerged in which some supervisors tended to supervise higher quality conceptualizations, those supervisors may inspect and edit the conceptualizations more thoroughly than other supervisors. Alternatively, the variability in supervisory effects could reflect the inconsistency of content that constitutes an effective case conceptualization. There is no agreed upon method in which to conduct case conceptualization nor research supporting the efficacy of specific formulation methods (Ridley, Jeffrey, & Roberson, 2017). Additionally, supervisors were not randomized to report numbers, and the variable effects across all analyses may be related to supervisors tending to supervise certain reports. The coding manual by which conceptualizations were coded for quality may have preferred certain styles of conceptualization over others. As such, the hypothesized contributors to case conceptualization (e.g., time) may have been masked by supervisory effects.

Second, the generalizability of these results was limited. All conceptualizations were collected from a single Midwestern clinical psychology training program that utilized primarily cognitive-behavioral theoretical training. Consistent with demographics of the Midwest, the majority of clients and students were white with very few ethnic, gender, or sexual minorities. Measuring case conceptualization ability from similar programs, particularly centered in urban and culturally diverse locations, would improve the generalizability of the results. Additionally, the inclusion of conceptualizations for children, couples, and other populations would improve the generalizability of the results.

Future Directions

Case conceptualization is an understudied clinical skill. Considering this is a core component in the assessment and treatment decision making process, case formulation still has little research on the most effective techniques and processes. The conceptualization process should integrate client characteristics, the latest available research, and a clinician's judgment. Yet, there are few studies to suggest the effectiveness of this, let alone how to train new therapists to develop conceptualizations. As such, there are two primary areas that need future research: 1) Effectiveness of training case conceptualization; and 2) The impact of training conceptualization on the provision of psychotherapy.

The present study is the first to empirically examine the effectiveness of clinical psychology training programs teaching case conceptualization. Because it appeared that supervisory effects may have masked individual therapist contributions, future studies

should examine case conceptualization development over time without influence of clinical supervisors. It is recommended that future studies measure case conceptualization quality at various time points prior to supervisory edits, which is consistent with competency-based supervision (Falendar & Shafranske, 2008).

Future research should also examine how therapists implement case conceptualizations. The present study utilized written case conceptualizations as a marker of case conceptualization quality. However, students who write high quality conceptualizations may not necessarily implement or utilize those conceptualizations in their decision making while in the room with the client. As students develop their intervention competencies, regularly referring to the conceptualization would be expected rather than rigidly implementing a protocol. Future studies should examine the degree to which individuals utilize conceptualizations in moment-by-moment treatment decision making.

Conclusions

The purpose of this study was to examine the development of the ability for students to conceptualize clinical cases throughout their graduate training. The overall quality of student's conceptualizations was fair; many students wrote sufficiently complex conceptualizations and few students incorporated cultural factors into their conceptualizations. Although none of the hypotheses were supported, these effects were likely influenced by clinical supervisors editing the conceptualizations. Consistent with the role that supervisors should operate as gatekeepers to the profession of psychology, it was unsurprising that supervisors influenced the quality of

conceptualizations. It appeared that this study was the first to quantitatively examine the development of case conceptualization ability during graduate training in clinical psychology, and the topic of case conceptualization needs further research to verify the effectiveness of case conceptualization teaching methodologies.

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APPENDICES

Appendix A: Formulation Content Coding Sheet

File number: _____

Coder Initials: _____

	Not Present	Somewhat Present	Clearly Present
Symptoms and Presenting Problems	0	1	2
Precipitating Stressors	0	1	2
Inferred Mechanism	0	1	2
Record Inferred Mechanism(s) Verbatim	<div></div> <div></div>		
Origin of Mechanism/Predisposing Life Events	0	1	2

Note. Refer to coding manual for descriptions of each rating category.

Formulation Quality Ratings:**1. Complexity**

No problem areas mentioned	Missing almost all of problem areas addressed in biopsychosocial history	About half of problem areas are addressed	Missing only 1 or 2 problem areas	All possible problem areas are included
0	1	2	3	4

Rate the overall complexity of the formulation. Highly complex formulations take into account several facets of the person's problems and functioning, integrating them into a meaningful presentation.

2. Precision of Language:

No individualized language used (e.g., could be copy and pasted for another client)	Almost entirely generic language, very little individualization	About half of the language is individualized and half is generic	Almost entirely individualized, some generic language	Completely individualized
0	1	2	3	4

Rate the overall precision of the language used in the formulation. Highly precise language is used to construct a formulation that is tailored to a unique individual. Language with little precision is used to construct a general formulation that could apply to almost anyone (Barnum effect). If generic terms are used, they should be followed by an example from the client's presentation. Note: This refers only to the quality and specificity of the language, not the quality or the amount of information covered.

3. Overall Coherence:

The conceptualization is disjointed and impossible to follow.	Little consistency between problem areas. May be disjointed at times. May have many mechanisms hypothesized.	Multiple mechanisms may be hypothesized. The narrative mostly hangs together, but the clinician missed opportunities to consolidate problem areas.	Almost all problem areas mentioned are explained with two or three mechanisms. Or one mechanism that doesn't seem to make sense to all problem areas.	All problem areas are explained with a single mechanism.
0	1	2	3	4

Rate the extent to which the formulation seems to "hang together," providing an internally consistent account of the individual's problems. *One way of judging coherence is attempting to summarize the formulation in a short sentence*

4. Multicultural Considerations:

No culture was mentioned.	There is an acknowledgement to cultural diversity, but it is not integrated in the conceptualization.	The clinician has some cultural references, but there was significant room for more discussion of culture.	The clinician addressed almost all possible cultural relevancies. They may have missed one or two cultural points.	All possible areas for culture were addressed. The clinician could not have included culture any better than they did.
0	1	2	3	4

Rate the degree to which the clinician took cultural considerations such as gender, race/ethnicity, sexual orientation, religion, or other demographic factors into account when formulating the case. High scores on multicultural considerations offer explicit and well-integrated cultural contexts into the conceptualization.

5. Overall Quality

No mechanism	Mechanism <i>not</i> linked to symptoms, precipitating event, or origin of mechanism	Mechanism linked to 1 of the following: symptoms, precipitating event, or predisposing event	Mechanism linked to 2 of the following: symptoms, precipitating event or predisposing event	Mechanism linked to all 3 of the following: symptoms, precipitating event, and predisposing event
0	1	2	3	4

Rate the overall quality of the vignette. A score of 0 will indicate no presentation of a mechanism. A score of 1 will indicate rudimentary presentation of a mechanism, which is not linked to symptoms/problems, precipitating stressors, and/or more distant predisposing events. A score of 2 will indicate a presentation of a mechanism that is tied to symptoms/problems. A score of 3 will indicate adequate or strong mechanism tied to symptoms/problems and either precipitating stressors or more distant predisposing events. A score of 4 will indicate a strong mechanism clearly linked to symptoms/problems, precipitating events, and predisposing events.

If the Inferred Mechanism was rated a “1” then the Overall Quality cannot score higher than 1.

The overall gestalt feeling should always trump the pieces that the mechanism is tied to.

Appendix B: File Coding Sheet

Last 3 digits of file number

Therapist ID Number			
Clinic	<i>PCC</i>	<i>ADC</i>	
Total number of sessions seen			
Client Age			
Client Ethnicity			
Client gender			
Client sexual orientation			
Date of the report			
Diagnoses	DSM-IV or DSM 5		
Supervising psychologist of the report			
Treatment completion	<i>Treatment Completion</i>	<i>Referral</i>	<i>Premature Termination</i>
			<i>Can't tell</i>

Appendix C: Therapist Demographic Survey

Prior to beginning the CPTP, what was your highest degree obtained?

- Bachelors degree or equivalent.
- Masters degree in clinical or counseling psychology
- Masters degree in other field
- Doctorate in any field

Prior to beginning the CPTP, what was your clinical experience? Check all that apply

- No previous clinical experience
- Working with mentally ill populations
- Administering assessments
- Providing therapy independently or under supervision of psychologist

What year did you begin the CPTP?

How old were you when you began the CPTP?

What is your gender?

- Male
- Female
- Transgender
- Other

Do you identify as a racial or ethnic minority?

This information is collected for the purpose of describing the sample for publication. This information will not be used in statistical analyses because of potentially identifying participants.

- Yes
- No

What is your full name?

Your name is necessary to connect the information from this survey to your assessment and treatment plans. You will be assigned a participant ID that will immediately replace your name. Your full name will be deleted from all databases except for a master coding list. This coding list will be erased promptly when data collection is finished. Only the principle investigator (i.e., Grant Shulman) and an undergraduate research assistant will have access to your name before it is deleted.